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# MODERNIZATION, FEMALE SOCIAL ROLES, AND FEMALE CRIME: A Replication of a Cross National Investigation

by

MUHAMMAD MIZANUDDIN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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**ABSTRACT**

This thesis examines the relation between indicators of modernization and female role-participation (GNP/per capita, urbanization, female participation in the labour force, female education, and fertility rate) and female crime (homicide, larceny, theft, and fraud) with data from approximately forty countries. Three hypotheses are tested to examine the relation. These are (i) modernization is positively related to female property crimes (female theft and fraud), but only slightly negatively or insignificantly related to female violent crimes (female homicide and larceny), (ii) female public role-participation is positively and domestic role-participation is negatively related to female property crime, and (iii) modernization is positively and indirectly related to female property crime through female role-participation along with having a persistent direct effect on female property crime. The results offer little support for these hypotheses. Virtually none of the variation in female homicide and female larceny is explained by our predictor variables. Urbanization has a positive moderate effect on female theft. Fertility shows a a moderate negative effect on female theft and fraud. These results support only a minor part of our hypotheses. Implications of this study and suggestions for future research are discussed.

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## 1. INTRODUCTION

The history of the systematic study of female criminality is not long. It is only recently that criminologists have examined the social structural bases of female criminality. Much of the stimulation for this work came from the works of Adler (1975, 1977), Smart (1978), Simon (1975), and Bowker (1978,1979). These writers report a considerable increase of female criminality and suggest more detailed and systematic study of the problem. As Adler notes,

> Traditionally, the perpetration of crime has been regarded as a male prerogative...But the second sex has risen...Women have entered all categories of the crime statistics. It took a general social movement sweeping the world with egalitarian forces to provide women with the opportunity for a more equal footing in the criminal hierarchy. And it appears that women have used this opportunity. (1977:101)'

In this study, Adler presents statistics from several countries and shows that female criminality is rising in every sphere and suggests that female criminality should not be regarded as at the margin of mainstream theorizing in criminology.

Smart points out,

> Our knowledge of the nature of female criminality is still in its infancy. In comparison with the massive documentation on all aspects of male delinquency and criminality, the amount of work carried out in the area of women and crime is extremely limited...Female criminality may therefore become such a 'problem', certainly public concern is already being expressed over the alleged increasing

---

'See also Freda Adler's book (1975) *"Sisters in Crime: The Rise of the New Female Criminal"*. In this book she also shows that women are commiting more crime then ever before.

> violence of juvenile girls. If an historical perspective on female criminality is adopted however then the topic of women and crime appears less like a new problem and more like one facet of human behaviour which has occured in different forms at all historical moments. Moreover, a recognition of the need to bring the question of female criminality and delinquency into an open forum for discussion and debate is necessary in order that we may critically challenge the emerging moral panic over the relationship of women's emancipation to increasing participation by women in criminal activity. (1976:1,XIV-XV)

Rita James Simon portrays the above situation in the following lines.

> We have learned that female criminality has received much less attention by criminologists... Even the most recent texts in criminology either ignore the topic, mention it in passing, or devote at most only a few pages to it. (1975:105)

Since the publication of the above works an increased interest in the study of female criminality has been stimulated. However, there have been few studies that can be cited as social structural examinations of female criminality in general and cross-national studies of female criminality in particular. The intention of the present thesis is to study the social structural bases of female criminality from a cross-national perspective. More specifically, an attempt has been made to study the interrelationships of modernization and female crime on a cross-national basis. Furthermore, the thesis also explores whether changing female social roles have any mediating effect on the above relationship. This means changes in the social participations of females in various social roles may be a linking mechanism between modernization and female

crime. Modernization may alter the social roles of females and thus indirectly affect female crime rates, as well as having direct effects on female crime. It should be mentioned here that the present study is basically a replication of the research done by Timothy F. Hartnagel (1982) where he analyses data from forty countries. At the outset of his study, Hartnagel notes:

> Modernization is predicted to have positive, direct effects on female property crime as well as positive, indirect effects through female role participation. (1982:1)

This thesis is an attempt to examine the above relationships once again, but with a variety of more recent cross-national data and several improvements in measurement that are explained in the following chapters.

## 2. REVIEW OF THE LITERATURE AND HYPOTHESES

The 'Industrial Revolution' can be termed as the landmark from which modern urban societies began to develop, replacing the traditional rural societies. As we know, the term 'Industrial Revolution' refers to the series of dramatic technological and economic innovations that occurred first in England during the period after approximately 1760. The mechanization of the textile industry, technical advance and expansion in the iron industry, the harnessing of steam power, the establishment of the factory system, and other related developments of that period revolutionized the English economy. Railroads, shipping industries, and business expanded dramatically along with the development of cities. This revolution began to expand to other western societies very shortly. By World War II most of the western societies became more or less urban-industrialized. Scholars began to differentiate this urban-industrial world from the rest of the traditional rural world by several terms such as, developed and underdeveloped, first and third world, modern and nonmodern, industrialized and nonindustrialized etc.

We, therefore, can see that the term 'modernization' is not different from the terms 'development', 'industrialization' and/or 'urbanization', at least when we refer to social change. This would be even clearer if we present Eisenstadt's (1973) distinctions between traditional and modern societies. According to him,

> ...traditional society was depicted as static, with little differentiation or specialization, a predominance of mechanical division of labor, a low level of urbanization and literacy, and a strong agrarian basis as its main focus of population. In contrast, modern society was seen as possessing a very high level of differentiation, a high degree of organic division of labor specialization, urbanization, literacy and exposure to mass media, and imbued with continuous drive toward progress. In the political realm, traditional society was depicted as based on 'traditional' elites ruling by some 'mandate of Heaven', whereas modern society was based on wide participation of masses, who did not accept traditional legitimigation of the rulers accountable in terms of secular values of justice, freedom, and efficiency. All above, traditional society was conceived as bound by the cultural horizons set by its tradition, and modern society was considered culturally dynamic and oriented to change and innovation.

'Modernization' and 'development' have been widely studied by social scientists, especially by sociologists. Though their explanations differ from each other, there is similarity in the way they look at the distinctions between modern and traditional societies. However, they explain the process of modernization somewhat differently.

In Wilbert Moore's (1963) explanation, the modernization process means a 'total' transformation of a traditional society into the types of technology and associated social organization that characterizes the 'advanced', economically prosperous, and relatively politically stable nations of the Western World.

Perhaps the best over-all summary of the indices of the modernization process has been provided by Karl Deutsch (1961) in the term 'social mobilization'. He defines it as,

> the process in which major clusters of old social,

> economic, and psychological commitments are eroded and broken and people become available for new patterns of socialization and behavior.

Deutsch has indicated that some of the main indices of social mobilization are exposure to aspects of modern life through demonstrations of machinery, buildings, consumers' goods, response to mass media, change of residence, urbanization, change from agricultural occupations, literacy, growth of per capita income, and so forth.

Similarly, according to Eisenstadt (1973), the modernization process can be described as the development of a high extent of differentiation; the development of free resources which are not committed to any fixed, ascriptive (kinship, territorial, etc.) groups; the development of specialized and diversified types of social organization; the development of wide nontraditional, 'national', or even supranational group identifications; and the concommitant development, in all major institutional spheres, of specialized roles and of special wider regulative and allocative mechanisms and organizations in economic life, voting and party activities in politics, and diverse bureaucratic organizations and mechanisms in most institutional spheres.

Neil Smelser (1963) defines modernization as structural differentiation. For him a developed economy and society is characterized as a highly differentiated structure and an underdeveloped one as relatively lacking in differentiation; hence change centres on the process of differentiation

itself. By 'differentiation' Smelser means the process by which more specialized and more autonomous social units are established. This he sees occurring in different spheres: in the economy, the family, the political system, and religious institutions.

Taylor and Hudson describe the process of modernization in the following way,

> The movement of people from isolated or sparsely settled places into cities is one of the most prominent aspects of modernization. Moreover, urbanization plays a key role in the politicalization of modern people. City dwellers are subjected to new ideas that are more easily communicated by the facilities of urban life. Traditional ties and restraints that are integral parts of village and rural life dissolve in the city. (1976:200)

It should be pointed out here that there are severe reappraisals, criticisms, and rejections of many of these assumptions regarding modernization theory which we have to keep in mind before accepting modernization as a 'universal process of social change' and a factor that may have several social consequences, one of which may be higher crime rates.

Modernization theory relates to the assumptions that industrialism is essentially a liberalizing force and a progressive one which provides a model from the western world for the rest of the traditional or underdeveloped societies to follow - a particular view of the dynamics of the contemporary world system (Moore, 1963; Smelser, 1959; Deutsch,1961). There are several scholars who oppose such a notion of modernization theory (Eisenstadt, 1973; Frank, 1971; Giddens, 1982; as well as other writers influenced by

the writings of Karl Marx). These stress the fact that modernization theory ignores the historical background for the development of western capitalism which was initiated by colonialism and still maintains its position (economic prosperity, high standard of living etc.) through economic exploitation in the underdeveloped countries. For a better understanding of the term 'modernization' we should discuss, in brief, some of these assumptions.

Eisenstadt (1973), for example, explains the problems that are associated with modern societies in terms of 'liberty versus authority', 'stability and continuity versus change', and 'rationality versus cultural orientations'. According to his explanations, in modern society the scope of liberty is continuously extended and, therefore, there is a problem of maintenance of stability and order in the face of expanding areas of liberty. The second problem, as he explains, is to determine whether the change or development should be gradual or revolutionary and to relate the positive attitude of change (which is attached to modernity) with that of institutional stability. The third problem in the modernization process, according to Eisenstadt, is to adjust modern social rationality (man's mastery over himself and his own destiny) with the traditional religious and other cultural orientations.

Quite contrary to the modernization theory, Frank (1971) argues, western merchant capital prevents the indigenous economic development of the underdeveloped

nations through its dominance over the latter. More elaborately, the development of western capitalist world was initiated by colonialization which allowed a huge transfer of gold, silver, and raw materials for the industries of the west. The development of the western world led to the development of poor or underdeveloped countries which were captured as colonies. These colonies became the markets for the industries of the west and the main suppliers of raw materials and cheap labour. In this way they lost their indigenous possibility to develop themselves in their own ways. After the colonial age, western capitalism continued its economic exploitation in the underdeveloped countries through economic trade and aid and imposed favourable terms and conditions for its own economic interest. Western capitalists also control the political situations in the underdeveloped countries through their economic allies in those countries. Such a situation suggests that modernization is not an universal process of social change in which the underdeveloped societies follow the developed societies. Rather, the development of the underdeveloped societies is due to the economic exploitation of the modern western world. Modernization theory appears, then, to be the ideological defence of the modern western world to maintain its economic dominance over the rest. As a result, a huge degree of economic inequality between the developed and the underdeveloped societies is realized (Giddens, 1982).

As industry and business expand, markets are becoming competitive and narrower, which leads to rising unemployment, economic inequality, individualism, and competition in the societies which exercise a capitalist mode of production and are modernized. Such a modernization process, then, may have several social consequences, one of which may be higher crime rates. Therefore, the etiology of higher (female) crime could be accounted for in terms of unemployment, economic inequality, and the larger context of capitalist society (Miller, 1983).

The reason for presenting these critical views of the modernization process is to trace the limitations of the concept of modernization that we are using in our research.

In recent cross-national analyses of crime, modernization has been defined in terms of urbanization and/or industrialization. Per capita income, division of labour, size of population, city size, and heterogeneity are the major indices of both modernization and urban-industrialization. More precisely, an area is called modernized or urban-industrialized when there are certain features like higher per capita income, a complex division of labour, a large population concentrated in a comparatively smaller area, and heterogeneous groups of people in terms of ethnic, religious, and other cultural traits. This will be clearer if we present the contrasting rural characteristics of low per capita income, simple division of labour, considerably smaller population

concentration, and a very homogeneous group of people.

There have been several studies of crime in general (rather than sex specific crime) in relation to urbanization and industrialization. Howard Zehr published a book entitled 'Crime and the Development of Modern Society' in 1976. In this book he examines historically the relationships between modernization and high crime rates and conveys the general views and observations regarding modernization and crime. He states:

> Everyone knows that crime is more frequent today than it was in the stable rural milieu of our grandparents and great grandparents. In fact, many would argue, such a trend is inevitable. Modernity implies a decline in respect for conventions, a reduction in social controls, a lessening of appreciation for the rights and property of others. What could be more logical than that delinquency should accompany the modernization process? Moreover, the growth of cities is usually considered a major catalyst in this development, for during the past century popular opinion, nourished by studies which were frequently biased against the city in favour of a nostalgic view of a lost rural paradise, has associated urban life with high crime rates. The city in the popular view, is characterized by instability, impersonal relationships, social disorganization and weakened social controls; it is the paradigm of modern society. Consequently the city is also characterized by high rates of delinquency and the urbanization process, which dissolves the more stable traditions of the countryside, results in crime. (1976:11)

Clinard and Abbott's (1973) study focuses on rising crime rates in relation to development. These authors study rising crime trends in both developed and developing countries and try to develop a comparative criminology. They notice that the process of development is bringing pronounced changes and among the more serious is the general

increase in crime. They hypothesize that one measure of development of a country probably is its rising crime rates along with basic changes in social institutions. They explain that the urban environment has a secularizing effect on people's beliefs and relationships as contact with modern science minimizes strict adherence to traditional religious views and practices. When industrialization occurs, family structure moves toward some kind of 'conjugal' pattern. Kinship ties are also going to be very loose. The heterogeneity of the city also brings the people into contact with varied patterns of living. A large population moves toward the city for higher income, education, and a better standard of living. This is associated with less appreciation of the rights and property of others, a greater emphasis on material goods , and finally, a reduction of traditional social bonds which results in higher crime rates in the cities. City life is contrary to the characteristics of traditional social bonds such as socio-economic status based upon ascriptive birth-right, kinship, extended family, mechanical division of labour etc. The transition from a traditional society to an urban one is associated with higher crime rates which, therefore, suggests that crime rates are higher in the absence of traditional social bonds and lower while social bonds are present.

The works of Emile Durkheim, especially The Division of Labor (1953), and Suicide (1951), had a considerable impact on the ideas of the later sociologists and criminologists.

In Durkheim's analyses the division of labor emerges as a product of the needs of a society which has become larger through an increase in population and a more highly integrated interactive network. According to him, the division of labor and concommitant industrialization are adaptive responses. Durkheim suggests that normally this process will produce an organic solidarity based on the functional interdependence demanded by the evolving forms of production. In his analyses he recognizes, however, that organic solidarity in industrial society does not always develop to effectively maintain group cohesiveness. An anomic division of labor leads to weakened social bonds which ultimately produce higher rates of suicide and crime. According to this model, industrialization should be directly related to higher crime rates. In recent years, there have been efforts to employ Durkheim's model in explaining the growth in crime rates which may accompany industrialization (Webb, 1972; Krohn, 1978;McDonald, 1976; Gibbs and Martin, 1966; Miley and Micklin, 1972). These authors explain the Durkheimian model as predicting that when a society becomes larger in respect to its population, its moral density (urbanization) and division of labor increase with a concommitant increase in its social disorganization (crime rate). They have tested this model with different indices of industrialization and crime. Their results are consistent with the idea that several indices of industrialization are positively correlated with

property and total crime rates, with the exception of violent crime rates. Lynn McDonald (1976), using international data, studied the relationships between crime rates and indices of urbanization such as GNP, urbanism, school enrollment, and size of the police force. Her study showed a positive relationship between urbanization and the property offender rate but an inverse relationship with the homicide offender rate.

All these studies suggest that modernization should be positively related to higher property crime rates. They also show that industrialization, urbanization, and/or development processes are accompanied by certain features, such as a large population concentration, heterogeneity, higher per capita income and education which lead to weakened social bonds that ultimately produce higher crime rates.

In every known society gender is a fundamental criterion for assigning a number of tasks to be performed by its members. Some tasks are assigned on the basis of sex-linked physiological differences, other tasks are assigned on the basis of what seem like the arbitrary products of particular socio-cultural traditions. The performance of socio-economic roles on the basis of gender is to be called 'sex-roles'. J. M. Nielsen defines sex-roles in the following way:

> Formally defined, 'sex-roles' are both expected and actual behaviors and characteristics that distinguish females from males in a given society. (1978:3)

Social scientists explain different factors as responsible for the emergence of sex-roles. One of the notions is biological differences between the sexes that require a division of labor according to which women are responsible for rearing children and maintaining the household, and men for securing the means of subsistence. Anthropological research in non-industrial societies reveals an association between the types of subsistence economy, that is, the kind of physical capacities needed in the society, and women's position relative to that of men (D'Andrade, 1966). According to Bott (1957), the changes in family structure created by urbanization may have contributed to modifications in men's and women's roles. Her data support the notion that the isolated nuclear family tends to apply more egalitarian sex-roles than the extended family pattern. Similarly, Goode (1963) explains that the development of industrialization, bureaucratization, and urbanization can hardly be separated from certain basic changes of social institutions, among which is the development of the nuclear family from the extended one. This approach suggests that the transition to the nuclear family from an extended one due to urbanization is a universal feature which leads to more egalitarian sex-roles in the urban society.

Sex-roles are different in different societies and such differences are usually seen as reflecting a general shift from a traditional, highly sex-differentiated system of

norms to a more egalitarian one that is less devoted to the assignment of responsibility on the basis of gender (Nielsen, 1978; Holter, 1973). It, therefore, appears that sex-roles change with modernization and such change occurs from a highly sex-differentiated system to a more egalitarian one. Also as economic production moves outside the family unit to factories, offices, and shops the need for women as well as men to contribute to the economic support of the family increases. This means that females participate to a greater extent in socio-economic activities outside the home in industrial society instead of being restricted to the role of mother inside the family unit.

We, therefore, can make a distinction between the sex-specific roles of women which are more or less centered around the home and are a feature of traditional society, and more egalitarian roles which allow women to participate in roles outside the home, such as different socio-economic and political activities, which are a feature of modern society. This distinction will be clearer if we term them as 'domestic roles' of women and 'public or social roles'. Domestic roles of women can be identified through the indicators of a higher fertility rate, greater economic dependence of women on men, female illiteracy, and, in general, more restriction on the activities of women. On the other hand, public or social roles of women can be identified through the indicators of higher participation of women in the labour force market, greater female education,

more voting and election rights, and the participation of women in other social and economic activities. In traditional society women perform and are more limited to the domestic roles, while this domestic role-participation of women expands to the greater performance of public or social roles in industrial or modern society. Such a shift of female role-participation in industrial society is being taken as a source for explaining the etiology of higher female crime rates which is discussed in much more detail in the following sections.

Sex-roles and female criminality is a topic that has not received much attention. However, there have been a few significant studies of female criminality in the late nineteenth and early twentieth centuries by Lombroso and Ferrero (1895), Thomas (1967, originally published 1923), and Pollak (1961, originally 1950). Smart (1978) refers to their works as classical studies and terms them as 'pioneer' studies in the area of women and crime. In Smart's words,

> Unlike other pioneer studies which have been surpassed and have become redundant though, these accounts of female criminality are still, in some form, exerting an influence on contemporary understandings of female crime. This influence lingers on largely because of the lack of interest in this area shown by criminologists, a disinterest which is evident in the paucity of critical studies of female criminality. (1976:27)

However, Smart regards these works as mostly biological and psychological in nature and suggests exploring the social structural components of sex roles and female crime rates. According to her explanation, female crime rate

variation may be seen not only as a result of the variation of sex roles but also as a result of a variation in other social structural variables that may have an impact upon both the development of female roles and female crime rates. Modernization may be one such variable.

Criminologists have only recently begun to explore social structural bases of female criminality. A few cross-national studies on the above subject have also been done.

Simon and Sharma (1979) examine the relationship of female participation in the labour force and female crime rates, using data from twenty five countries. Their hypothesis is that the increasing movement of women from their traditional roles towards outside employment and activities leads to higher crime rates. They interpret the results as consistent with their hypothesis. They conclude:

> Women's participation in selective crimes will increase both as their employment opportunities expand and as their interests, desires, and definition of self shift from a more traditional to a more liberal view. The crimes that are considered most salient for this hypothesis are various types of property, financial and white-collar offenses. (1979:392)

These authors also note that ,

> more detailed information is needed from different types of societies on female labour force participation and other socioeconomic indicators that may be related to overall female crime rates and two types of criminal activities. Such data from a variety of countries representing different cultural and religious values, levels of economic development, and types of social institutions would also help to separate specific national trends from more general trends in women's role in crime. (1979:400)

Adler's (1977) work is concentrated on the relationship between converging gender roles and increased female crime. She uses crime data from several countries (number of countries not specified) of the world and reports that as the distance between males and females in performing socioeconomic roles decreases, female crime increases. Bowker (1978) attempts to test Adler's theory using International Statistics on female crime rates. He notes,

> In view of the fact that those rises in female crime that have been documented are almost entirely due to an increase in female property crime, future investigations on the subject would do better to examine this area of female criminal behaviour in detail than to be distracted by polemics about the new violent female criminal than are based on much weaker empirical evidence. (1978:11)

Bowker (1979), in another study, reexamines the relative influence of education, politics, family, and economy plus the process of modernization, upon female total crime using international data from Interpol statistics and the Handbook of International Data on Women. The general model upon which his research is based is one that relates higher female crime rates to modernization. At the same time he tests whether female role participation in the major social institutions has any effect on the above relationship. In this study he finds weak support for Adler's hypothesis of a "new female criminal" (female's participation in violent and general crime). But he finds considerable support for Adler's two other alternative theories namely "economic need" (women commit crime out of economic need) and "economic opportunity" (women commit

crime out of increasing economic opportunity). He explains that as emancipation progresses, women are less likely to be paternalistically cared for. Increasing numbers of women are either on their own or at least only partly dependent on the income of men. As more and more women enter a labour market that is not infinitely elastic, female unemployment rises, and this increases women's motivation to commit property crime due to economic need, rather than violent crimes. It is also a fact that with economic development and women's emancipation not only motivation to commit property crime by women increases but also the opportunities to commit property crime increases. Increased availability of goods, changes in transportation, currency, techonology, commerce, merchandising, self-service shopping, and the increased availability of credit and credit cards etc. are much more favourable for an economically deprived woman to commit property crime in an industrial society than rural society where these opportunities are absent (Tobias, 1967; Steffensmeier, 1978; Hartnagel, 1982)

Hartnagel's study of "Modernization, Female Social Roles And Female Crime: A Cross National Investigation" (1982) is the most recent research in this area. His work examines the relationship between modernization and female crime rates and tests a model which incorporates female participation in various social roles as an intervening variable. Though he found only weak support for the general model, GNP/per capita showed a net positive, direct effect

on female crime generally and specifically on the property crimes types of theft and fraud. From this Hartnagel hypothesizes,

> as economic development occurs women may be freed from the restraints of traditional institutions and informal mechanisms of social control and this greater freedom may result in higher rates of female crime. (1982:487)

It, therefore, appears that there should be a relationship between modernization and higher crime rates. It also appears that there should be a connection of higher female crime rates with modernization and changes of sex-roles. Though there have been very few studies on modernization, female social roles, and female crime, these studies (Adler, 1977; Bowker, 1978; Bowker, 1979; McDonald, 1976; Simon, 1975; Hartnagel, 1982) suggest that modernization itself is a process which is associated with population concentration, higher GNP/per capita, heterogeneity, industrialization, weakened social bonds, and egalitarian sex-roles which ultimately produce higher female crime rates. Though some of the previous literature suggests a general shift of sex-roles from a highly sex-differentiated system to a more egalitarian one, which implies that women should enter into all categories of crime with more a equal proportion to men (Neilsen, 1978; Holter, 1973, Adler, 1977), other female crime specific studies suggest a positive relationship between modernization and female property crime but a minor negative or no relationship between modernization and female violent crime

(Bowker, 1979; McDonald, 1976; Hartnagel, 1982). The reasons for higher female property crime rates and lower violent crime rates have been analysed in terms of the process of modernization and changes in sex-roles. When modernization occurs, it is not only the fact that it is accompanied by population concentration, higher GNP/per capita, heterogeneity, industrialization and weakened social bonds, but also the more egalitarian sex-roles bring greater economic independence for women. However, women are entering into a labour market which is already controlled and occupied by men. By tradition men receive better positions and incomes in the labour market. Though they are more economically independent in modern society, females, in general, earn relatively less than males (Miller, 1983). On the other hand, the labour force market is not infinitely elastic. As more females enter the labour market, female unemployment may rise and this increases women's motivation to commit property crimes rather than violent crimes (Bowker, 1979). Moreover, increased availability of goods, changes in transportation, currency, technology, commerce, merchandising, self-service shopping, and increased availability of credit and credit cards open up the opportunities to commit property crime rather than violent crime for women (Steffensmeier, 1978; Hartnagel, 1982).

Another reason for women not to be violent criminals is that they are, in general, relatively more closely tied to social relations with their parents, husband, and children

than are men. Though women participate more in public or social roles in industrial society, their comparatively lower income than men suggests that female emancipation has not yet reached a level equal to that of men. This suggests that women are still being paternalistically cared for to some extent, though comparatively much less than in traditional society, and are expected to remain in domestic roles, at least in reduced form, such as taking care of children and the household. Such situations lead women to have more social ties with their parents, husband, and children than men. Thus their familial social bonds operate to restrain them from at least extra-familial violence. Furthermore, violent crimes frequently occur due to some sort of socialization to the values of an aggressive subculture (Wolfgang and Ferracuti, 1967). Genarally males are expected to be more aggressive. While forms of behaviour for expressing the aggression vary by culture to culture, this socialization of males to greater aggression seems charaterictic of urban-industrial, as well as traditional societies. Therefore, females are less likely to engage in as many violent crimes.

We can see that few studies have examined the impact of modernization and changes in sex-roles on female crime. What is needed now is to explore in much more detail the impact of different indices of modernization and to assess the direct and indirect influence of modernization through the change in female role participation on female crime.

On the basis of the above literature review and discussion we can derive a model for the study of the above subject. The model specifies that modernization has positive indirect effects on female property crime through female role participation, along with the persistence of the positive, direct effects of modernization on female property crime. This means modernization has direct, positive effects on female property crime. At the same time modernization has an indirect, positive effect on female property crime through female social role participation. We, therefore, expect that change in the social participation of females in various social roles intervenes and establishes a link between modernization and female crime. The traditional sex-specific domestic role of females (the role of traditional house-wife and mother) is expected to be negatively related to female property crime while the public or social role participation (more egalitarian not sex-specific role participation) by women in society is expected to be positively related to female property crime.

**HYPOTHESES**

Based upon the previous research the following hypotheses were specified for testing in the present study.

1. There is a positive relationship between modernization and female property crime (theft and fraud), but a minor, negative or no relationship with female violent

crime (homicide and larceny).[2]

2. Female public role-participation is positively and domestic role-participation negatively related to female property crime. More specifically, female property crime rates are lower in those societies where females are more restricted to the domestic role of wife and mother. On the contrary, female property crime rates are higher in those societies where females have greater access to public role participation.

3. Female social participation (participation in public roles) intervenes between modernization and female property crime in such a way that modernization has a positive indirect effect on female property crime through female public role participation, along with the persistence of positive, direct effects of modernization on female property crime.

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[2]Larceny is defined in INTERPOL as robbery with dangerous aggrevating circumstances. See definitions of crime on page 28.

## 3. DATA COLLECTION AND MEASUREMENT

Data on modernization, female social roles, and female crime were collected for forty countries from various publications of government and international agencies. These publications are: International Criminal Police Organization (INTERPOL, 1973, 1974, 1975, 1976); Handbook of International Data on Women (1976); World Bank Atlas (1961-1968); Demographic Yearbook (1963-1970); and World Handbook of Political and Social Indicators (1976).

Data on forty countries were collected not on the basis of any random sampling procedure. Rather the forty countries were selected on the basis of availability of data on the various measures. These countries are listed in table 1.

These countries represent a cross-section of developed and developing nations having sufficient information on modernization, female social roles, and female crime. These countries adequately represent the developed and the developing world: 15 countries are from the developed world and 25 countries are from the developing world. These countries also cover almost every region of the world.

Data on female crime were collected from the crime statistics published by the International Criminal Police Organization (INTERPOL) for the years 1973 through 1976. Four broad categories of female crime were selected for this study. These are 'homicide' (INTERPOL code A - murder and attempted murder); 'larceny' (INTERPOL code C' - robbery,

Table - 1

List of the Countries

| | |
|---|---|
| Australia | Kuwait |
| Austria | Lesotho |
| Bahamas | Libyan Arab Republic |
| Burma | Luxemburg |
| Chile | Madagascar |
| Cyprus | Malawi |
| Denmark | Malaysia |
| Egypt | Mali |
| EI Salvador | Morocco |
| France | Monaco |
| Fiji | Nigeria |
| Germany, Federal Republic of | Norway |
| Greece | New Zealand |
| Guyana | Netherlands |
| Hong Kong | Peru |
| Ivory Coast | Phillippines |
| India | Sierra Leone |
| Jamaica | Sweden |
| Japan | Trinidad and Tobago |
| Korea, Republic of | United Kingdom |

burglary); 'theft' (INTERPOL code C'' - theft); and 'fraud' (INTERPOL code D - swindling, embezzlement, misappropriation, forgery, false pretenses). The reason for selecting these four broad categories of female crime was that specific crimes may be legally defined in different ways in different countries. However, the use of these four somewhat broad categories of crime should increase the comparability of these data cross-nationally. In INTERPOL these crimes have been defined in the following way:

Homicide:

Murder: any act performed with the purpose of taking human life, no matter in what circumstances. This definition excludes manslaughter and abortion but not infanticide. (INTERPOL)

Larceny:

robbery with dangerous aggrevating circumstances (e.g. armed robbery, burglary, housebreaking). (INTERPOL)

Theft:

all other kinds of larceny (e.g. theft, receiving). (INTERPOL)

Fraud:

any act of gaining unlawful possession of another person's property other than by larceny (i.e. embezzlement, misappropriation, forgery, false pretenses, trickery, deliberate misrepresentation-swindles in general). (INTERPOL)

These cross-national INTERPOL crime data have been increasingly utilized by criminologists in recent years (McDonald, 1976; Wolf, 1971; Wellford, 1974; Krohn, 1978; Krohn and Wellford, 1977; Hartnagel, 1982). Many of these authors have reviewed the problems associated with the use

of such data and have concluded that, similar to the Uniform Crime Reports in the United States, they are appropriate if employed with caution. Krohn and Wellford (1977), on the basis of comparative victimization studies, suggest that perhaps the problem of systematic bias in these data is not as crucial as has been previously suggested. Krohn (1978) has stated that the few victimization studies conducted in less developed countries indicate a comparable level of underreporting to that found in the United States, which suggests a minimization of systematic bias owing to less adequate reporting procedures in less developed countries. Furthermore, Wellford (1974)' claimed that, with the exception of drug and sex offenses, there is little if any cross-national variation in the definition of the offenses tabulated by INTERPOL, and he went on to point out that, although it has been suggested that more crime would be underreported in predominantly rural, developing societies, comparison of victimization and official data for rural and urban areas in the United States does not support the claim of major rural-urban differences in reporting and apprehension.

It should be mentioned here that homicide and larceny have been defined as violent crimes and theft and fraud as property crimes.

Initially several indices of modernization were selected to test the model. These were average annual growth in GNP/per capita (in US dollars), urbanization

(percentage of population living in cities), population heterogeneity (ethnic-linguistic fractionalization), and population growth (annual growth rate of population of each country).

Data on population heterogeneity (ethnic-linguistic fractionalization) were collected from the World Handbook of Political and Social Indicators for 1968. However, this variable had to be dropped from the study due to the absence of sufficient data on each country.

Data on population growth (annual growth rate of population of each country) were collected from The Demographic Yearbook over the years 1963 to 1970. Finally, this variable also had to be dropped because of its high collinearity (r=.69) with a measure of female role-participation, the fertility rate. Such a high intercorrelation means that the two variables are not independent and it is, therefore, inappropriate to use both of them. Furthermore, such collinearity produces unreliable coefficients in correlation and regression.

Data on the average annual growth rate in GNP/per capita were collected from the World Bank Atlas over the years 1961 to 1968.

Data on urbanization (percentage of population living in cities) were collected from the World Handbook of Political and Social Indicators for 1969.[3]

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[3]These data on urbanization were originally collected under the direction of Kingsley Davis and published by International Population and Urban Research, Institute of International Studies, University of California, Berkeley,

Because of the theoretical model for the study, data on several indices of female role participation were required. Data on both domestic and public role participation were collected to test the model. Initially, several indicators of female role participation were selected. These were: crude labour force participation rate for females (ratio of the total economically active female population to the total female population of all ages); index of femaleness for third level education (university and professional school education); fertility rate (number of live births per 1,000 female population); crude rate of marriage (number of formally recognized marriages performed per 1,000 persons present in the same country at the mid-point of the year); year of universal suffrage and type of voting right (the year all women in a given country were granted the right to vote, or the year universal suffrage was granted); index of femaleness for economic activity (active population of males and females on persons economically active by occupation); index of segregation of economic activity by occupation (proportion of economically active females in the occupational structure); and index of femaleness for illiteracy (number of female illiterates divided by the

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[3](cont'd)in 1969. Kingsley Davis and his International Population and Urban Research group have suggested the use of urban areas similar to the Standard Metropolitan Statistical Areas of the United States cencus. These consists of a central city and those administrative divisions contiguous to the city or to the continuous urban areas that are metropolitan in character, the whole of which has at least 100,000 people. See Kingsley Davis's The World Metropolitan Areas, Berkeley, 1959.

total illiterate population). Data on the above indicators of female role participation were collected from the Handbook of International Data on Women (1976) and most of the data were for 1968. Ultimately, crude labour force participation for females and the index of femaleness for third level education were selected as the indicators of female public role-participation and the fertility rate as the indicator of female domestic role-participation in the study. All the other potential indicators were excluded from the study since they were either highly correlated with the selected indicators or were missing for a number of countries.

It should be mentioned here that if we look for cause and effect we have to keep in mind that causes must precede their effects. In the present study it has been taken that indices of modernization and female role-participation are preceding variables that occur first to act on or produce the higher female crime rates (effect). Keeping this in mind, data have been collected on the various indices of modernization and female role-participation and female crime in such a way that there is a time gap between the antecedent and the consequent. However, there is no general theory regarding how much of a time gap is required for an antecedent to produce the consequent, particularly in the social sciences. In the present study a 2 to 5 year time gap between the indices of modernization and female role-participation, on the one hand, and female crime on the

other has been utilized. This time gap between the independent and dependent variables was calculated on the basis of when the independent variables end and when the dependent variables start. The starting point of the crime data is 1973 and the ending points of the independent variables are 1968 to 1970.

Hartnagel used data on modernization, female role participation, and female crime for a single year (1971). In the present study data on the dependent and independent variables were collected for several years. It was mentioned earlier that data on female crime were collected for four years (1973, 1974, 1975, and 1976) in the present study. Average female crime rates were calculated over these years. It is recognized by criminologists that there are some fluctuations in crime recording and reporting in each country from year to year. Average crime rates have been used to minimize such fluctuations in crime recording and reporting. Data on the female population at the age of fifteen and above were collected for these same four years (1973, 1974, 1975, 1976) for each country. Each category of female crime for each year was divided by the female population of the same year and then multiplied by 10,000. In this way the average female crime rates wrere calculated for each country.

It was also mentioned earlier that the average annual growth rate in GNP/per capita (1961 to 1968), and the percentage of the population living in cities (1969) were

selected as the indices of modernization for each country. Hartnagel used GNP/per capita and urbanity as the indices of modernization for a single year (1971). However, these measures did not reflect the process of change through which modernization occurs. The fact is modernization is not a fixed phenomenon. It occurs through a process of social change. That means modernization does not occur at a fixed time period. It is a continuous process through which the different indicators of modernization change over time. In the present study efforts were made to more adequately measure such a continuous process of modernization. Specifically, one measure of modernization - average annual growth rate in GNP/per capita - incorporates this notion of process and thus improves on Hartnagel's (1982) measures. Unfortunately, we were unable to obtain comparable data on urbanization.

## 4. DATA ANALYSIS

Before proceeding to test our hypotheses and evaluate the model, certain descriptive data on the variables are necessary. Frequency distributions of each of the independent and dependent variables were constructed to examine whether the data were normally distributed and whether any statistical data transformation procedure (such as square root and/or log transformation) was required. These descriptive data provide basic information for a better understanding of our variables and permit an evaluation of certain assumptions (e.g. normal distribution) of correlation and regression techniques.

Dependent Variables: Our dependent variables are homicide, larceny, theft, and fraud. Frequency distributions for each of these variables are displayed in tables 2, 3, 4, and 5 respectively. The values in these tables are the original untransformed ones. We can see that for each of these tables the distributions are not normal. If we look at table 2, we find that the fequency distribution of homicide is very skewed to the lower values. As a result there is a noticeable difference between its mean and median. Most countries have low homicide rates while a few have quite high rates. The value .965 looks like an outlier in this table. The distributions in the other three tables (3, 4, 5) are more widely spead out (greater range) but are also skewed to the lower values. In these cases (larceny, theft, and fraud)

Table - 2

Frequency Distribution of Average Female Homicide Rates
(1973-1976) per 10,000 Females Age 15 and Above

| Homicide Rate | Frequency | Cumulative % | Homicide Rate | Frequency | Cumulative % | Homicide Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.005 | 1 | 3 | 0.077 | 1 | 42 | 0.272 | 1 | 74 |
| 0.010 | 2 | 8 | 0.090 | 1 | 45 | 0.307 | 1 | 76 |
| 0.017 | 2 | 13 | 0.093 | 1 | 47 | 0.440 | 1 | 79 |
| 0.020 | 2 | 18 | 0.100 | 1 | 50 | 0.503 | 1 | 82 |
| 0.030 | 1 | 21 | 0.110 | 2 | 55 | 0.506 | 1 | 84 |
| 0.045 | 1 | 24 | 0.120 | 1 | 58 | 0.545 | 1 | 87 |
| 0.046 | 1 | 26 | 0.127 | 1 | 61 | 0.550 | 1 | 89 |
| 0.060 | 1 | 29 | 0.160 | 1 | 63 | 0.665 | 1 | 92 |
| 0.070 | 2 | 34 | 0.175 | 1 | 66 | 0.700 | 1 | 95 |
| 0.072 | 1 | 37 | 0.210 | 1 | 68 | 0.795 | 1 | 97 |
| 0.075 | 1 | 39 | 0.245 | 1 | 71 | 0.965 | 1 | 100 |

N = 38

Mean = 0.222
Median = 0.100
Skewness = 1.417
Range = 0.960

Table - 3

Frequency Distribution of Average Female Larceny Rates
(1973-1976) per 10,000 Females Age 15 and Above

| Larceny Rate | Frequency | Cumulative % | Larceny Rate | Frequency | Cumulative % | Larceny Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.010 | 3 | 7 | 0.290 | 1 | 40 | 2.330 | 1 | 72 |
| 0.013 | 1 | 10 | 0.296 | 1 | 42 | 2.675 | 1 | 75 |
| 0.055 | 1 | 13 | 0.363 | 1 | 45 | 3.473 | 1 | 77 |
| 0.070 | 1 | 15 | 0.542 | 1 | 47 | 4.000 | 1 | 80 |
| 0.125 | 1 | 17 | 0.643 | 1 | 50 | 5.880 | 1 | 82 |
| 0.130 | 1 | 20 | 0.675 | 1 | 52 | 7.180 | 1 | 85 |
| 0.145 | 1 | 22 | 0.995 | 1 | 55 | 7.670 | 1 | 88 |
| 0.152 | 1 | 25 | 1.072 | 1 | 57 | 13.660 | 1 | 90 |
| 0.162 | 1 | 27 | 1.150 | 1 | 60 | 16.560 | 1 | 92 |
| 0.200 | 1 | 30 | 1.367 | 1 | 63 | 19.925 | 1 | 95 |
| 0.240 | 1 | 32 | 1.405 | 1 | 65 | 25.810 | 1 | 97 |
| 0.255 | 1 | 35 | 1.777 | 1 | 67 | 111.785 | 1 | 100 |
| 0.267 | 1 | 38 | 1.903 | 1 | 70 | | | |

N = 40

Mean = 5.882 Skewness = 5.403
Median = 0.644 Range = 111.775

Table - 4

Frequency Distribution of Average Female Theft Rates
(1973-1976) per 10,000 Females Age 15 and Above

| Theft Rate | Freq uency | Cumul ative % | Theft Rate | Freq uency | Cumul ative % | Theft Rate | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| 0.150 | 1 | 3 | 1.592 | 1 | 37 | 9.450 | 1 | 71 |
| 0.230 | 1 | 6 | 1.765 | 1 | 40 | 10.250 | 1 | 74 |
| 0.277 | 1 | 9 | 2.492 | 1 | 43 | 11.170 | 1 | 77 |
| 0.500 | 1 | 11 | 2.863 | 1 | 46 | 11.592 | 1 | 80 |
| 0.530 | 1 | 14 | 3.092 | 1 | 49 | 13.215 | 1 | 83 |
| 0.570 | 1 | 17 | 3.367 | 1 | 51 | 15.856 | 1 | 86 |
| 0.620 | 1 | 20 | 4.565 | 1 | 54 | 19.973 | 1 | 89 |
| 0.860 | 1 | 23 | 5.660 | 1 | 57 | 21.645 | 1 | 91 |
| 1.130 | 1 | 26 | 6.847 | 1 | 60 | 32.916 | 1 | 94 |
| 1.365 | 1 | 29 | 7.910 | 1 | 63 | 38.600 | 1 | 97 |
| 1.400 | 1 | 31 | 8.513 | 1 | 66 | 73.170 | 1 | 100 |
| 1.430 | 1 | 34 | 8.962 | 1 | 69 | | | |

N=35

Mean = 9.272
Median = 3.367

Skewness = 3.077
Range = 73.020

Table - 5

Frequency Distribution of Average Female Fraud Rates
(1973-1976) per 10,000 Females Age 15 and Above

| Fraud Rate | Frequency | Cumulative % | Fraud Rate | Frequency | Cumulative % | Fraud Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.010 | 1 | 2 | 0.435 | 1 | 38 | 2.740 | 1 | 70 |
| 0.012 | 1 | 5 | 0.442 | 1 | 40 | 3.243 | 1 | 72 |
| 0.015 | 1 | 7 | 0.765 | 1 | 42 | 3.660 | 1 | 75 |
| 0.025 | 1 | 10 | 0.870 | 1 | 45 | 3.695 | 1 | 77 |
| 0.095 | 1 | 13 | 0.940 | 1 | 47 | 6.693 | 1 | 80 |
| 0.150 | 1 | 15 | 0.967 | 1 | 50 | 9.205 | 1 | 82 |
| 0.215 | 1 | 17 | 1.025 | 1 | 52 | 10.215 | 1 | 85 |
| 0.225 | 1 | 20 | 1.215 | 1 | 55 | 11.505 | 1 | 88 |
| 0.265 | 2 | 25 | 1.220 | 1 | 57 | 13.822 | 1 | 90 |
| 0.267 | 1 | 27 | 1.467 | 1 | 60 | 17.300 | 1 | 92 |
| 0.283 | 1 | 30 | 1.592 | 1 | 63 | 18.775 | 1 | 95 |
| 0.325 | 1 | 32 | 2.093 | 1 | 65 | 21.362 | 1 | 97 |
| 0.392 | 1 | 35 | 2.113 | 1 | 67 | 27.107 | 1 | 100 |

N = 40

Mean = 4.175
Median = 0.968

Skewness = 2.020
Range = 27.097

the differences between means and medians are much greater than in the case of homicide. In each instance the mean is substantially greater, indicating its sensitivity to extreme values. The rates 111.785 for larceny and 73.170 for theft are far away from the other values of these distributions. These values are outliers and contribute to widening the range of the distributions.

So all four dependent variables exhibit a significant degree of skewness in their distributions. Therefore, some type of transformation of each is required in order to meet the requirement of a near normal distribution. The conventional forms of transformation are to take the square root or the logarithm of the original values (Siegel, forthcoming).

In the first stage a square root transformation of each of these variables was done and the resulting distributions examined. The square root frequency distribution for each dependent variable is displayed in tables 6, 7, 8, and 9 respectively. In the second stage log transformations of the original values of each dependent variable were done. The log transformed frequency distributions are displayed in tables 10, 11, 12, and 13. Among these data transformations, the square root frequency distribution of homicide in table 6 exhibits a more normal shape where the difference between the mean and median has been considerably reduced and the outlier eliminated.

However, the square root distributions for the other three

Table - 6

Frequency Distribution of Square Root of Average Female Homicide Rates (1973-1976), per 10,000 Females Age 15 and Above

| Square Root of Homicide Rate | Frequency | Cumulative % | Square Root of Homicide Rate | Frequency | Cumulative % | Square Root of Homicide Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.071 | 1 | 3 | 0.277 | 1 | 42 | 0.522 | 1 | 74 |
| 0.100 | 2 | 8 | 0.300 | 1 | 45 | 0.554 | 1 | 76 |
| 0.130 | 2 | 13 | 0.305 | 1 | 47 | 0.663 | 1 | 79 |
| 0.141 | 2 | 18 | 0.316 | 1 | 50 | 0.709 | 1 | 82 |
| 0.173 | 1 | 21 | 0.332 | 2 | 55 | 0.711 | 1 | 84 |
| 0.212 | 1 | 24 | 0.346 | 1 | 58 | 0.738 | 1 | 87 |
| 0.214 | 1 | 26 | 0.356 | 1 | 61 | 0.742 | 1 | 89 |
| 0.245 | 1 | 29 | 0.400 | 1 | 63 | 0.815 | 1 | 92 |
| 0.265 | 2 | 34 | 0.418 | 1 | 66 | 0.837 | 1 | 95 |
| 0.268 | 1 | 37 | 0.458 | 1 | 68 | 0.892 | 1 | 97 |
| 0.274 | 1 | 39 | 0.495 | 1 | 71 | 0.992 | 1 | 100 |

N = 38

Mean = 0.401
Median = 0.317
Skewness = 0.774
Range = 0.922

Table - 7

Frequency Distribution of Square Root of Average Female Larceny Rates (1973-1976), per 10,000 Females Age 15 and Above

| Square Root of Larceny Rate | Frequency | Cumulative % | Square Root of Larceny Rate | Frequency | Cumulative % | Square Root of Larceny Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.100 | 3 | 7 | 0.539 | 1 | 40 | 1.526 | 1 | 72 |
| 0.114 | 1 | 10 | 0.544 | 1 | 42 | 1.636 | 1 | 75 |
| 0.235 | 1 | 13 | 0.602 | 1 | 45 | 1.864 | 1 | 77 |
| 0.265 | 1 | 15 | 0.736 | 1 | 47 | 2.000 | 1 | 80 |
| 0.354 | 1 | 17 | 0.802 | 1 | 50 | 2.425 | 1 | 82 |
| 0.361 | 1 | 20 | 0.822 | 1 | 52 | 2.680 | 1 | 85 |
| 0.381 | 1 | 22 | 0.997 | 1 | 55 | 2.769 | 1 | 88 |
| 0.390 | 1 | 25 | 1.035 | 1 | 57 | 3.696 | 1 | 90 |
| 0.402 | 1 | 27 | 1.072 | 1 | 60 | 4.069 | 1 | 92 |
| 0.447 | 1 | 30 | 1.169 | 1 | 63 | 4.464 | 1 | 95 |
| 0.490 | 1 | 32 | 1.185 | 1 | 65 | 5.080 | 1 | 97 |
| 0.505 | 1 | 35 | 1.333 | 1 | 67 | 10.573 | 1 | 100 |
| 0.517 | 1 | 38 | 1.379 | 1 | 70 | | | |

N = 40

Mean = 1.494
Median = 0.805
Skewness = 3.069
Range = 10.473

Table - 8

Frequency Distribution of Square Root of Average Female Theft Rates (1973-1976), per 10,000 Females Age 15 and Above.

| Square Root of Theft Rate | Freq uency | Cumul ative % | Square Root of Theft Rate | Freq uency | Cumul ative % | Square Root of Theft Rate | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| 0.387 | 1 | 3 | 1.262 | 1 | 37 | 3.074 | 1 | 71 |
| 0.480 | 1 | 6 | 1.329 | 1 | 40 | 3.202 | 1 | 74 |
| 0.526 | 1 | 9 | 1.579 | 1 | 43 | 3.342 | 1 | 77 |
| 0.707 | 1 | 11 | 1.692 | 1 | 46 | 3.405 | 1 | 80 |
| 0.728 | 1 | 14 | 1.758 | 1 | 49 | 3.635 | 1 | 83 |
| 0.755 | 1 | 17 | 1.835 | 1 | 51 | 3.982 | 1 | 86 |
| 0.787 | 1 | 20 | 2.137 | 1 | 54 | 4.469 | 1 | 89 |
| 0.927 | 1 | 23 | 2.379 | 1 | 57 | 4.652 | 1 | 91 |
| 1.063 | 1 | 26 | 2.617 | 1 | 60 | 5.737 | 1 | 94 |
| 1.168 | 1 | 29 | 2.812 | 1 | 63 | 6.213 | 1 | 97 |
| 1.183 | 1 | 31 | 2.918 | 1 | 66 | 8.554 | 1 | 100 |
| 1.196 | 1 | 34 | 2.994 | 1 | 69 | | | |

N = 35

Mean = 2.442
Median = 1.835

Skewness = 1.416
Range = 8.167

Table - 9

Frequency Distribution of Square Root of Average Female Fraud Rates (1973-1976), per 10,000 Females Age 15 and Above.

| Square Root of Fraud Rate | Freq uency | Cumul ative % | Square Root of Fraud Rate | Freq uency | Cumul ative % | Square Root of Fraud Rate | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| 0.100 | 1 | 2 | 0.660 | 1 | 38 | 1.655 | 1 | 70 |
| 0.110 | 1 | 5 | 0.665 | 1 | 40 | 1.801 | 1 | 72 |
| 0.122 | 1 | 7 | 0.875 | 1 | 42 | 1.913 | 1 | 75 |
| 0.158 | 1 | 10 | 0.933 | 1 | 45 | 1.922 | 1 | 77 |
| 0.308 | 1 | 13 | 0.970 | 1 | 47 | 2.587 | 1 | 80 |
| 0.387 | 1 | 15 | 0.983 | 1 | 50 | 3.034 | 1 | 82 |
| 0.464 | 1 | 17 | 1.012 | 1 | 52 | 3.196 | 1 | 85 |
| 0.474 | 1 | 20 | 1.102 | 1 | 55 | 3.392 | 1 | 88 |
| 0.515 | 2 | 25 | 1.105 | 1 | 57 | 3.718 | 1 | 90 |
| 0.517 | 1 | 27 | 1.211 | 1 | 60 | 4.159 | 1 | 92 |
| 0.532 | 1 | 30 | 1.262 | 1 | 63 | 4.333 | 1 | 95 |
| 0.570 | 1 | 32 | 1.447 | 1 | 65 | 4.622 | 1 | 97 |
| 0.626 | 1 | 35 | 1.454 | 1 | 67 | 5.206 | 1 | 100 |

N = 40

Mean = 1.515
Median = 0.984

Skewness = 1.250
Range = 5.106

Table - 10

Frequency Distribution of Log of Average Female Homicide Rates (1973-1976), per 10,000 Females Age 15 and Above

| Log of Homicide Rate | Frequency | Cumulative % | Log of Homicide Rate | Frequency | Cumulative % | Log of Homicide Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| -2.301 | 1 | 3 | -1.114 | 1 | 42 | -0.565 | 1 | 74 |
| -2.000 | 2 | 8 | -1.046 | 1 | 45 | -0.513 | 1 | 76 |
| -1.770 | 2 | 13 | -1.032 | 1 | 47 | -0.357 | 1 | 79 |
| -1.699 | 2 | 18 | -1.000 | 1 | 50 | -0.298 | 1 | 82 |
| -1.523 | 1 | 21 | -0.959 | 2 | 55 | -0.296 | 1 | 84 |
| -1.347 | 1 | 24 | -0.921 | 1 | 58 | -0.264 | 1 | 87 |
| -1.337 | 1 | 26 | -0.896 | 1 | 61 | -0.260 | 1 | 89 |
| -1.222 | 1 | 29 | -0.796 | 1 | 63 | -0.177 | 1 | 92 |
| -1.155 | 2 | 34 | -0.757 | 1 | 66 | -0.155 | 1 | 95 |
| -1.143 | 1 | 37 | -0.678 | 1 | 68 | -0.100 | 1 | 97 |
| -1.125 | 1 | 39 | -0.611 | 1 | 71 | -0.007 | 1 | 100 |

N = 38

Mean = -0.974
Median = -0.999
Skewness = -0.291
Range = 2.294

Table - 11

Frequency Distribution of Log of Average Female Larceny Rates (1973-1976), per 10,000 Females Age 15 and Above

| Log of Larceny Rate | Frequency | Cumulative % | Log of Larceny Rate | Frequency | Cumulative % | Log of Larceny Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| -2.000 | 3 | 7 | -0.538 | 1 | 40 | 0.367 | 1 | 72 |
| -1.886 | 1 | 10 | -0.529 | 1 | 42 | 0.427 | 1 | 75 |
| -1.260 | 1 | 13 | -0.440 | 1 | 45 | 0.541 | 1 | 77 |
| -1.155 | 1 | 15 | -0.266 | 1 | 47 | 0.602 | 1 | 80 |
| -0.903 | 1 | 17 | -0.192 | 1 | 50 | 0.769 | 1 | 82 |
| -0.886 | 1 | 20 | -0.171 | 1 | 52 | 0.856 | 1 | 85 |
| -0.839 | 1 | 22 | -0.002 | 1 | 55 | 0.885 | 1 | 88 |
| -0.818 | 1 | 25 | 0.030 | 1 | 57 | 1.135 | 1 | 90 |
| -0.790 | 1 | 27 | 0.061 | 1 | 60 | 1.219 | 1 | 92 |
| -0.699 | 1 | 30 | 0.136 | 1 | 63 | 1.299 | 1 | 95 |
| -0.620 | 1 | 32 | 0.148 | 1 | 65 | 1.412 | 1 | 97 |
| -0.593 | 1 | 35 | 0.250 | 1 | 67 | 2.048 | 1 | 100 |
| -0.573 | 1 | 38 | 0.279 | 1 | 70 | | | |

N = 40

Mean = -0.167
Median = -0.187

Skewness = -0.187
Range = 4.048

Table - 12

Frequency Distribution of Log of Average Female Theft Rates (1973-1976), per 10,000 Females Age 15 and Above

| Log of Theft Rate | Frequency | Cumulative % | Log of Theft Rate | Frequency | Cumulative % | Log of Theft Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| -0.824 | 1 | 3 | 0.202 | 1 | 37 | 0.976 | 1 | 71 |
| -0.638 | 1 | 6 | 0.247 | 1 | 40 | 1.011 | 1 | 74 |
| -0.558 | 1 | 9 | 0.397 | 1 | 43 | 1.048 | 1 | 77 |
| -0.301 | 1 | 11 | 0.457 | 1 | 46 | 1.064 | 1 | 80 |
| -0.276 | 1 | 14 | 0.490 | 1 | 49 | 1.121 | 1 | 83 |
| -0.244 | 1 | 17 | 0.527 | 1 | 51 | 1.200 | 1 | 86 |
| -0.208 | 1 | 20 | 0.659 | 1 | 54 | 1.300 | 1 | 89 |
| -0.066 | 1 | 23 | 0.753 | 1 | 57 | 1.335 | 1 | 91 |
| 0.053 | 1 | 26 | 0.836 | 1 | 60 | 1.517 | 1 | 94 |
| 0.135 | 1 | 29 | 0.898 | 1 | 63 | 1.587 | 1 | 97 |
| 0.146 | 1 | 31 | 0.930 | 1 | 66 | 1.864 | 1 | 100 |
| 0.155 | 1 | 34 | 0.952 | 1 | 69 | | | |

N = 35

Mean = 0.536
Median = 0.527
Skewness = -0.141
Range = 2.688

Table - 13

Frequency Distribution of Log of Average Female Fraud Rates (1973-1976), per 10,000 Females Age 15 and Above

| Log of Fraud Rate | Freq uency | Cumul ative % | Log of Fraud Rate | Freq uency | Cumul ative % | Log of Fraud Rate | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| -2.000 | 1 | 2 | -0.362 | 1 | 38 | 0.438 | 1 | 70 |
| -1.921 | 1 | 5 | -0.355 | 1 | 40 | 0.511 | 1 | 72 |
| -1.824 | 1 | 7 | -0.116 | 1 | 42 | 0.563 | 1 | 75 |
| -1.602 | 1 | 10 | -0.060 | 1 | 45 | 0.568 | 1 | 77 |
| -1.022 | 1 | 13 | -0.027 | 1 | 47 | 0.826 | 1 | 80 |
| -0.824 | 1 | 15 | -0.015 | 1 | 50 | 0.964 | 1 | 82 |
| -0.668 | 1 | 17 | 0.011 | 1 | 52 | 1.009 | 1 | 85 |
| -0.648 | 1 | 20 | 0.085 | 1 | 55 | 1.061 | 1 | 88 |
| -0.577 | 2 | 25 | 0.086 | 1 | 57 | 1.141 | 1 | 90 |
| -0.573 | 1 | 27 | 0.166 | 1 | 60 | 1.238 | 1 | 92 |
| -0.548 | 1 | 30 | 0.202 | 1 | 63 | 1.274 | 1 | 95 |
| -0.488 | 1 | 32 | 0.321 | 1 | 65 | 1.330 | 1 | 97 |
| -0.407 | 1 | 35 | 0.325 | 1 | 67 | 1.433 | 1 | 100 |

N = 40

Mean = -0.027
Median = -0.014

Skewness = -0.404
Range = 3.433

dependent variables in tables 7, 8, and 9 still show significant departures from normality. These distributions are extremely skewed to the lower values, their means and medians differ substantially and they continue to exhibit outliers, especially for larceny and theft. We can see that the log transformed frequency distributions of larceny, theft, and fraud in tables 11, 12, and 13, respectively, produce better distributions for these variables. In these frequency distributions the means and medians of larceny, theft, and fraud are quite close, their ranges and skewness have been considerably reduced and outliers have also been eliminated. After examining all these frequency distributions, the square root of homicide, log of larceny, log of theft, and log of fraud seem the best values with respect to the criterion of a normal distribution of these variables.

Independent Variable: Our independent variables are GNP/per capita, urbanization, female labour force participation, fertility rate, and female education. Frequency distributions for the original values of each of these variables are displayed in tables 14,15, 16, 17, and 18 respectively. Among these tables the frequency distributions for female labour force and female education appear to be normal. The means and medians of these two variables in tables 16 and 18 are close in value, the data values are not markedly skewed and there do not appear to be any outliers. The frequency distributions for the remaining

three independent variables exhibit greater skewness, generally in the direction of their lower values. They also exhibit larger ranges and extreme values.

We, therefore, had to transform the original values of GNP/per capita and fertility into their square root and log and then compare these transformed values to select the more normal distribution for the correlation and regression analysis. The variable urbanization was transformed in a different way because the values of this variable were percentages (percentage of people living in cities), not any rate or proportion. First it was converted into a proportion from the percentage values by dividing each of these values by 1 minus the same values and then transformed into its log. Such a transformation gives this variable a somewhat improved shape, which is displayed in table 23. It's mean and median do now not differ greatly and it also does not have as large a range, outliers, or much skewness. The square root and log frequency distribution of GNP/per capita and fertility are displayed in tables 19, 20, 21, and 22. When all the frequency distributions (original, square root, and log values) of GNP/per capita and fertility were compared, the square root of GNP/per capita and the square root of fertility appear to give the best possible distributions with

respect to their differences in means and medians, ranges, and skewness (tables 20 and 22 respectively). These tables do not also exhibit outliers. In this way the square root

Table - 14

Frequency Distribution of Average Annual Growth Rate in GNP/per capita, 1961-1968

| GNP | Frequency | Cumulative % | GNP | Frequency | Cumulative % | GNP | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 0.100 | 1 | 3 | 2.000 | 1 | 37 | 3.700 | 1 | 76 |
| 0.300 | 1 | 5 | 2.100 | 2 | 42 | 4.100 | 1 | 79 |
| 0.400 | 1 | 8 | 2.200 | 1 | 45 | 4.300 | 1 | 82 |
| 0.600 | 1 | 11 | 2.400 | 2 | 50 | 4.400 | 1 | 84 |
| 0.800 | 2 | 16 | 2.600 | 1 | 53 | 4.800 | 1 | 87 |
| 1.000 | 1 | 18 | 2.700 | 1 | 55 | 5.600 | 1 | 89 |
| 1.300 | 1 | 21 | 3.000 | 1 | 58 | 5.900 | 1 | 92 |
| 1.500 | 1 | 24 | 3.200 | 2 | 63 | 8.100 | 1 | 95 |
| 1.600 | 1 | 26 | 3.300 | 1 | 66 | 9.900 | 1 | 97 |
| 1.700 | 2 | 32 | 3.400 | 2 | 71 | 19.400 | 1 | 100 |
| 1.800 | 1 | 34 | 3.600 | 1 | 74 | | | |

N = 38

Mean = 3.300 Skewness = 3.276
Median = 2.450 Range = 19.300

Table - 15

Frequency Distribution of Percentage of Population Living in Urban Areas, 1969

| % Urban | Frequency | Cumulative % | % Urban | Frequency | Cumulative % | % Urban | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 3.100 | 1 | 3 | 20.300 | 1 | 38 | 38.000 | 1 | 74 |
| 4.800 | 1 | 5 | 21.300 | 1 | 41 | 38.800 | 1 | 77 |
| 5.000 | 1 | 8 | 22.800 | 1 | 44 | 39.400 | 1 | 79 |
| 5.300 | 1 | 10 | 23.100 | 1 | 46 | 51.500 | 1 | 82 |
| 5.400 | 1 | 13 | 25.100 | 1 | 49 | 52.500 | 1 | 85 |
| 5.600 | 1 | 15 | 26.400 | 1 | 51 | 57.900 | 1 | 87 |
| 9.000 | 1 | 18 | 27.500 | 1 | 54 | 62.100 | 1 | 90 |
| 9.500 | 1 | 21 | 31.500 | 1 | 56 | 63.200 | 1 | 92 |
| 9.700 | 1 | 23 | 33.300 | 1 | 59 | 71.600 | 1 | 95 |
| 12.400 | 2 | 28 | 33.800 | 1 | 62 | 98.800 | 1 | 97 |
| 14.300 | 1 | 31 | 34.000 | 1 | 64 | 99.000 | 1 | 100 |
| 15.000 | 1 | 33 | 34.200 | 1 | 67 | | | |
| 18.900 | 1 | 36 | 37.600 | 1 | 72 | | | |

N = 39

Mean = 31.069
Median = 26.400

Skewness = 1.244
Range = 95.900

Table - 16

Frequency Distribution of Crude Female Labour Force Participation Rate, 1968

| Labour Force | Freq uency | Cumul ative % | Labour Force | Freq uency | Cumul ative % | Labour Force | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| 0.027 | 1 | 3 | 0.179 | 2 | 39 | 0.302 | 1 | 69 |
| 0.040 | 1 | 6 | 0.204 | 1 | 42 | 0.303 | 2 | 75 |
| 0.048 | 2 | 11 | 0.209 | 1 | 44 | 0.307 | 1 | 78 |
| 0.059 | 1 | 14 | 0.210 | 1 | 47 | 0.326 | 1 | 81 |
| 0.113 | 1 | 17 | 0.212 | 1 | 50 | 0.329 | 1 | 83 |
| 0.136 | 1 | 19 | 0.234 | 1 | 53 | 0.360 | 1 | 86 |
| 0.142 | 1 | 22 | 0.250 | 1 | 56 | 0.371 | 1 | 89 |
| 0.149 | 1 | 25 | 0.265 | 1 | 58 | 0.391 | 1 | 92 |
| 0.160 | 1 | 28 | 0.279 | 1 | 61 | 0.473 | 1 | 94 |
| 0.161 | 1 | 31 | 0.280 | 1 | 64 | 0.507 | 1 | 97 |
| 0.178 | 1 | 33 | 0.288 | 1 | 67 | 0.566 | 1 | 100 |

N = 36

Mean = 0.239
Median = 0.212
Skewness = 0.479
Range = 0.539

Table - 17

Frequency Distribution of Fertility Rate
(Live Births Per 1000 Females), 1968

| Fertility Rate | Frequency | Cumulative % | Fertility Rate | Frequency | Cumulative % | Fertility Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 22.000 | 1 | 3 | 69.000 | 2 | 39 | 113.000 | 1 | 73 |
| 48.000 | 1 | 6 | 70.000 | 1 | 42 | 137.000 | 1 | 76 |
| 52.000 | 1 | 9 | 72.000 | 1 | 45 | 144.000 | 1 | 79 |
| 54.000 | 1 | 12 | 79.000 | 1 | 48 | 150.000 | 1 | 82 |
| 57.000 | 1 | 15 | 80.000 | 1 | 52 | 153.000 | 1 | 85 |
| 58.000 | 1 | 18 | 81.000 | 1 | 55 | 159.000 | 1 | 88 |
| 59.000 | 1 | 21 | 82.000 | 1 | 58 | 170.000 | 1 | 91 |
| 60.000 | 2 | 27 | 90.000 | 2 | 64 | 216.000 | 1 | 94 |
| 62.000 | 1 | 30 | 95.000 | 1 | 67 | 220.000 | 1 | 97 |
| 64.000 | 1 | 33 | 112.000 | 1 | 70 | 250.000 | 1 | 100 |

N = 33

Mean = 99.909
Median = 80.000
Skewness = 1.234
Range = 228.000

Table - 18

Frequency Distribution of Index of Femaleness for 3rd Level Education (Percentage of Female Students in all degree granting and non-degree granting institutions of higher education), 1968

| Index of 3rd Level Education | Frequency | Cumulative % | Index of 3rd Level Education | Frequency | Cumulative % | Index of 3rd Level Education | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 8.000 | 1 | 3 | 26.000 | 2 | 33 | 38.000 | 1 | 74 |
| 11.000 | 1 | 5 | 27.000 | 1 | 36 | 39.000 | 1 | 77 |
| 14.000 | 3 | 13 | 28.000 | 1 | 38 | 40.000 | 2 | 82 |
| 16.000 | 1 | 15 | 29.000 | 2 | 44 | 42.000 | 2 | 87 |
| 17.000 | 1 | 18 | 30.000 | 2 | 49 | 48.000 | 1 | 90 |
| 18.000 | 1 | 21 | 31.000 | 1 | 51 | 49.000 | 1 | 92 |
| 20.000 | 1 | 23 | 32.000 | 3 | 59 | 55.000 | 2 | 97 |
| 21.000 | 1 | 26 | 34.000 | 3 | 67 | 78.000 | 1 | 100 |
| 24.000 | 1 | 28 | 37.000 | 2 | 72 | | | |

N = 39

Mean = 31.564 Skewness = 0.924
Median = 31.000 Range = 78.000

of GNP/per capita, log of converted urbanization, female labour force participation (original values), female education (original values) and the square root of fertility rate were identified as the best values for the independent variables with respect to the criterion of a normal distribution.

We tested our model by using the transformed independent variables of the sqare root of GNP/per capita, log of converted urbanization, and square root of the fertility rate, as well as the original values of female labour force participation and female education with the transformed dependent variables of the square root of homicide and the log of larceny, theft, and fraud. The model, once again, specified that modernization has indirect, positive effects on female property crime through female role participation, along with the persistence of direct effects of modernization on female property crime. Modernization is expected to have only minor negative effects on female violent crime. It should be mentioned here once again that no random sampling procedure was followed in this study and, therefore, no significance tests are appropriate. Therefore, attention will be focused upon the descriptive statistics for our sample of countries, though significance tests will be reported to aid the reader in interpreting the results.

The correlation matrix of the dependent and independent variables is displayed in table 24. For female homicide,

Table - 19

Frequency Distribution of Square Root of Average Annual Growth Rate In GNP/per capita, 1961-1968

| Square Root of GNP | Freq uency | Cumul ative % | Square Root of GNP | Freq uency | Cumul ative % | Square Root of GNP | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| 0.316 | 1 | 3 | 1.414 | 1 | 37 | 1.924 | 1 | 76 |
| 0.548 | 1 | 5 | 1.449 | 2 | 42 | 2.025 | 1 | 79 |
| 0.632 | 1 | 8 | 1.483 | 1 | 45 | 2.074 | 1 | 82 |
| 0.775 | 1 | 11 | 1.549 | 2 | 50 | 2.098 | 1 | 84 |
| 0.894 | 2 | 16 | 1.612 | 1 | 53 | 2.191 | 1 | 87 |
| 1.000 | 1 | 18 | 1.643 | 1 | 55 | 2.366 | 1 | 89 |
| 1.140 | 1 | 21 | 1.732 | 1 | 58 | 2.429 | 1 | 92 |
| 1.225 | 1 | 24 | 1.789 | 2 | 63 | 2.846 | 1 | 95 |
| 1.265 | 1 | 26 | 1.817 | 1 | 66 | 3.130 | 1 | 97 |
| 1.304 | 2 | 32 | 1.844 | 2 | 71 | 4.405 | 1 | 100 |
| 1.342 | 1 | 34 | 1.897 | 1 | 74 | | | |

N = 38

Mean = 1.658 Skewness = 1.322
Median = 1.561 Range = 4.088

Table - 20

Frequency Distribution of Log of Average
Annual Growth Rate In GNP/per capita, 1961-1968

| Log of GNP | Freq uency | Cumul ative % | Log of GNP | Freq uency | Cumul ative % | Log of GNP | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| -1.000 | 1 | 3 | 0.301 | 1 | 37 | 0.568 | 1 | 76 |
| -0.523 | 1 | 5 | 0.322 | 2 | 42 | 0.613 | 1 | 79 |
| -0.398 | 1 | 8 | 0.342 | 1 | 45 | 0.633 | 1 | 82 |
| -0.222 | 1 | 11 | 0.380 | 2 | 50 | 0.643 | 1 | 84 |
| -0.097 | 2 | 16 | 0.415 | 1 | 53 | 0.681 | 1 | 87 |
| 0.0 | 1 | 18 | 0.431 | 1 | 55 | 0.748 | 1 | 89 |
| 0.114 | 1 | 21 | 0.477 | 1 | 58 | 0.771 | 1 | 92 |
| 0.176 | 1 | 24 | 0.505 | 2 | 63 | 0.908 | 1 | 95 |
| 0.204 | 1 | 26 | 0.519 | 1 | 66 | 0.991 | 1 | 97 |
| 0.230 | 2 | 32 | 0.531 | 2 | 71 | 1.288 | 1 | 100 |
| 0.255 | 1 | 34 | 0.556 | 1 | 74 | | | |

N = 38

Mean = 0.348
Median = 0.385

Skewness = -0.890
Range = 2.288

Table - 21

Frequency Distribution of Square Root of Fertility Rate, 1968

| Square Root of Fertility Rate | Frequency | Cumulative % | Square Root of Fertility Rate | Frequency | Cumulative % | Square Root of Fertility Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 4.690 | 1 | 3 | 8.307 | 2 | 39 | 10.630 | 1 | 73 |
| 6.928 | 1 | 6 | 8.367 | 1 | 42 | 11.705 | 1 | 76 |
| 7.211 | 1 | 9 | 8.485 | 1 | 45 | 12.000 | 1 | 79 |
| 7.348 | 1 | 12 | 8.888 | 1 | 48 | 12.247 | 1 | 82 |
| 7.550 | 1 | 15 | 8.944 | 1 | 52 | 12.369 | 1 | 85 |
| 7.616 | 1 | 18 | 9.000 | 1 | 55 | 12.610 | 1 | 88 |
| 7.681 | 1 | 21 | 9.055 | 1 | 58 | 13.038 | 1 | 91 |
| 7.746 | 2 | 27 | 9.487 | 2 | 64 | 14.697 | 1 | 94 |
| 7.874 | 1 | 30 | 9.747 | 1 | 67 | 14.832 | 1 | 97 |
| 8.000 | 1 | 33 | 10.583 | 1 | 70 | 15.811 | 1 | 100 |

N = 33

Mean = 9.666 Skewness = 0.751
Median = 8.944 Range = 11.121

Table - 22

Frequency Distribution of Log of Fertility Rate, 1968

| Log of Fertility Rate | Frequency | Cumulative % | Log of Fertility Rate | Frequency | Cumulative % | Log of Fertility Rate | Frequency | Cumulative % |
|---|---|---|---|---|---|---|---|---|
| 1.342 | 1 | 3 | 1.839 | 2 | 39 | 2.053 | 1 | 73 |
| 1.681 | 1 | 6 | 1.845 | 1 | 42 | 2.137 | 1 | 76 |
| 1.716 | 1 | 9 | 1.857 | 1 | 45 | 2.158 | 1 | 79 |
| 1.732 | 1 | 12 | 1.898 | 1 | 48 | 2.176 | 1 | 82 |
| 1.756 | 1 | 15 | 1.903 | 1 | 52 | 2.185 | 1 | 85 |
| 1.763 | 1 | 18 | 1.908 | 1 | 55 | 2.201 | 1 | 88 |
| 1.771 | 1 | 21 | 1.914 | 1 | 58 | 2.230 | 1 | 91 |
| 1.778 | 2 | 27 | 1.954 | 2 | 64 | 2.234 | 1 | 94 |
| 1.792 | 1 | 30 | 1.978 | 1 | 67 | 2.342 | 1 | 97 |
| 1.806 | 1 | 33 | 2.049 | 1 | 70 | 2.398 | 1 | 100 |

N = 33

Mean = 1.942
Median = 1.903
Skewness = 0.059
Range = 1.056

Table - 23

Frequency Distribution of Log of Converted Percentage of Population Living in Urban Areas, 1969

| Log of % Urban | Freq uency | Cumul ative % | Log of % Urban | Freq uency | Cumul ative % | Log of % Urban | Freq uency | Cumul ative % |
|---|---|---|---|---|---|---|---|---|
| -3.442 | 1 | 2 | -1.368 | 1 | 38 | -0.490 | 1 | 72 |
| -2.987 | 1 | 5 | -1.307 | 1 | 40 | -0.456 | 1 | 75 |
| -2.944 | 1 | 7 | -1.220 | 1 | 42 | -0.431 | 1 | 77 |
| -2.883 | 1 | 10 | -1.203 | 1 | 45 | 0.060 | 1 | 80 |
| -2.863 | 1 | 13 | -1.093 | 1 | 47 | 0.100 | 1 | 82 |
| -2.825 | 1 | 15 | -1.025 | 1 | 50 | 0.319 | 1 | 85 |
| -2.314 | 1 | 17 | -0.969 | 1 | 52 | 0.484 | 1 | 88 |
| -2.254 | 1 | 20 | -0.777 | 1 | 55 | 0.541 | 1 | 90 |
| -2.231 | 1 | 22 | -0.695 | 1 | 57 | 0.925 | 1 | 92 |
| -1.955 | 1 | 27 | -0.672 | 1 | 60 | 6.213 | 2 | 97 |
| -1.791 | 2 | 30 | -0.663 | 1 | 63 | 6.907 | 1 | 100 |
| -1.735 | 1 | 32 | -0.654 | 1 | 65 | | | |
| -1.457 | 1 | 35 | -0.507 | 2 | 70 | | | |

N = 40

Mean = -0.648 Skewness = 2.155
Median = -1.021 Range = 10.349

the results show that neither modernization variables nor the female role participation variables are strongly related to female homicide. As expected, GNP/per capita is negatively related to female homicide at a low level. Our results show fertility positively related to female homicide, though the relation is relatively small (.26). The overall results are generally supportive of our hypothesis regarding female homicide.

For female larceny, the results are similar to those for homicide, except for fertility. It was mentioned earlier that in the present study larceny is also defined as a violent type of crime. We, therefore, expect similar results for larceny and homicide. The correlation results indicate that GNP/per capita and fertility rate have minor negative relationships with female larceny, while urbanization, labour force participation and female education show virtually no relation to female larceny. So these results are consistent with our hypothesis.

Turning to female theft, urbanization (.36) and fertility (-.45) are moderately related to female theft in the expected directions. GNP/per capita, female labour force participation, and female education are also related to female theft in the predicted positive direction, though with small values. It, therefore, appears that the results for female theft are only somewhat supportive of the hypothesis.

Table - 24

Correlation Matrix of Indices of Modernization, Female Role-Participation and Female Crime

| | Homicide | Larceny | Theft | Fraud |
|---|---|---|---|---|
| GNP | -.23 (38) | -.25 (38) | .09 (33) | -.02 (38) |
| Urban | .14 (38) | .22 (40) | .38 (35)* | .19 (40) |
| Labour Fc. | .01 (35) | .06 (36) | .16 (31) | .20 (36) |
| Education | .16 (38) | .08 (39) | .19 (34) | .23 (39) |
| Fertility | .26 (31) | -.05 (33) | -.45 (29)** | -.37 (33)* |

*$p < .05$
**$p < .01$
***$p < .001$

The correlation results exhibit little support for our hypothesis regarding female fraud. Only fertility rate has even a moderate relationship with female fraud in the predicted (negative) direction. Urbanization, female labour force, and female education are related to female fraud in the predicted direction but with small values. GNP/per capita appears unrelated to female fraud

Overall, these data do not exhibit much support for our hypotheses. However, there are a few findings to note. The fertility rate, as predicted, is negatively related to female property crime, at least to a moderate degree. Urbanization is also moderately related to female theft and in the positive direction, as expected. Finally, as expected, there is little relation between modernization and female violent crime.

An examination of the intercorrelations among the independent variables was conducted. The intercorrelations of indices of modernization and female role-participation are displayed in table 25. Only fertility shows a moderate collinearity with the other variables, namely GNP/per capita (-.53), and female labour force (-.47). Therefore, we can proceed to use all five of these independent variables in multiple correlation and regression.

The correlations in table 24 show the total association between each independent and the several dependent variables. They did not take into account the possible effects of antecedent variables (spuriousness), the pattern

Table - 25

Intercorrelations among Indices of Modernization and Female Role-Participation

| | GNP | Urban | Labour Fc. | Education | Fertility |
|---|---|---|---|---|---|
| GNP | - | .28 (38) | -.14 (35) | -.10 (38) | -.53 (31)** |
| Urban | | - | .30 (36) | .26 (39) | .27 (33) |
| Labour Fc. | | | - - | .10 (36) | -.47 (31)** |
| Education | | | | - | -.19 (32) |
| Fertility | | | | | |

*p $<$.05
**p $<$.01
***P $<$.001

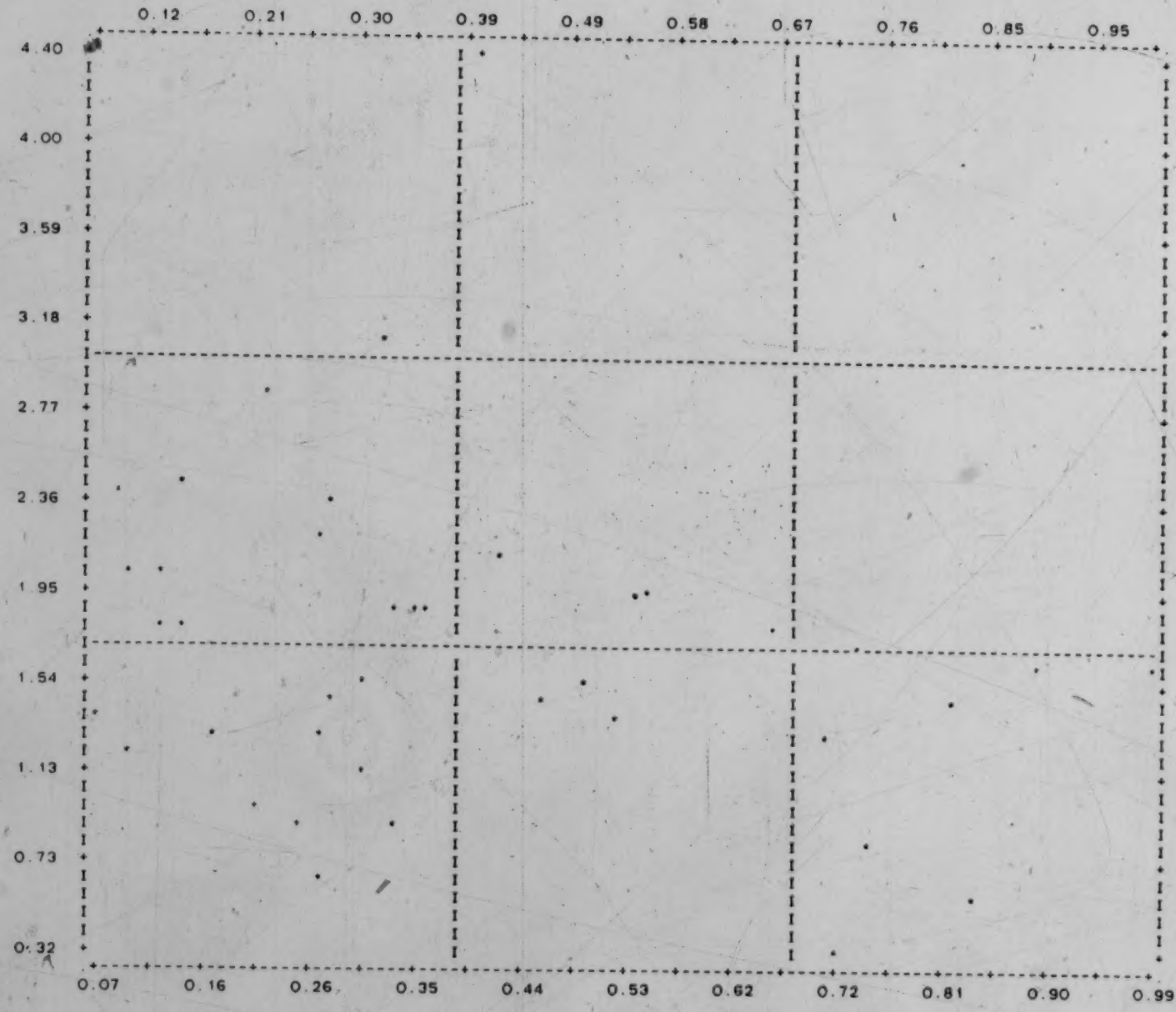


TABLE 26. Scattergram of Square Root of GNP/per capita (down) and Square Root of Homicide Rate (across)

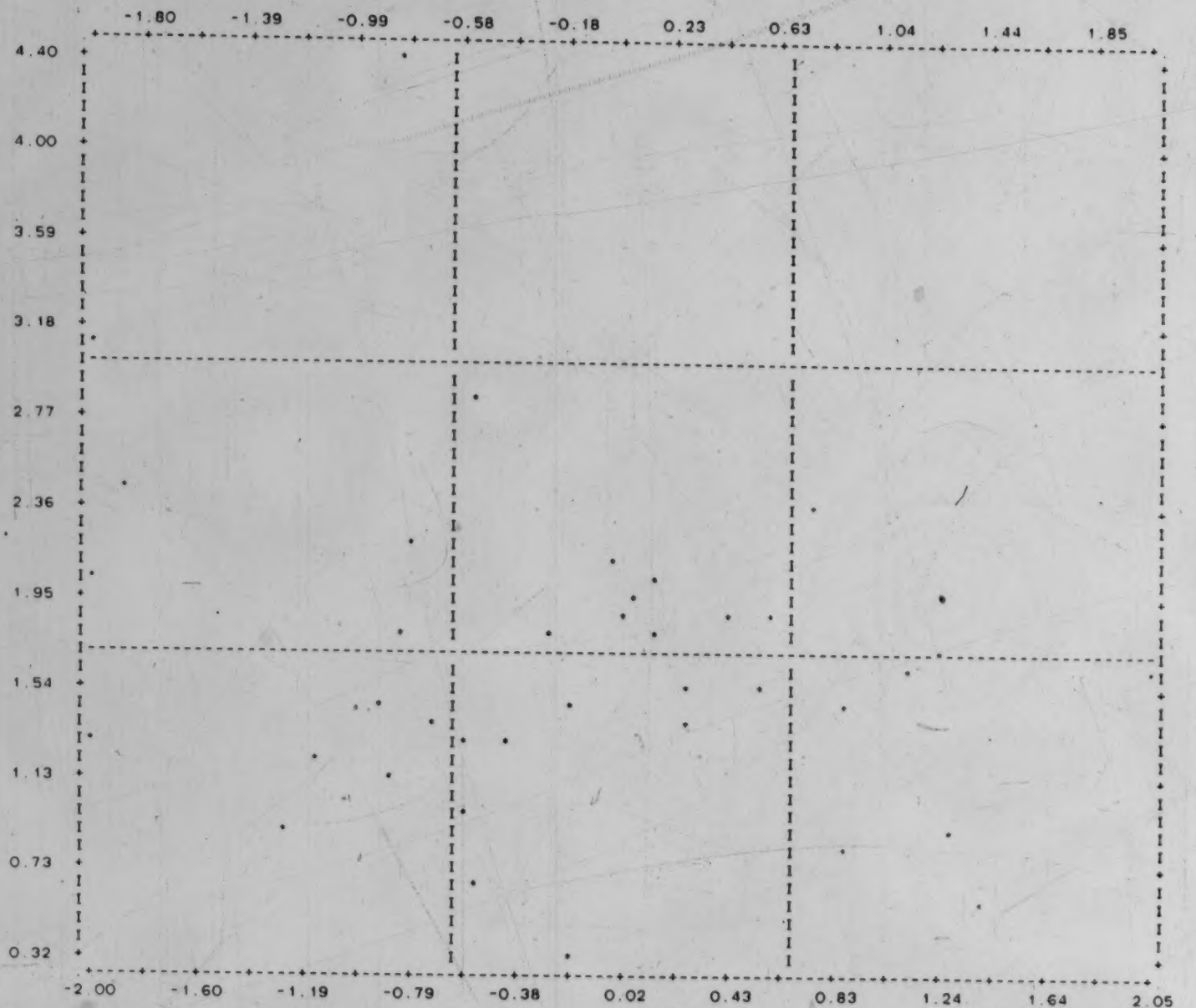


TABLE 27: Scattergram of Square Root of GNP/per capita (down) and Log of Larceny Rate (across)

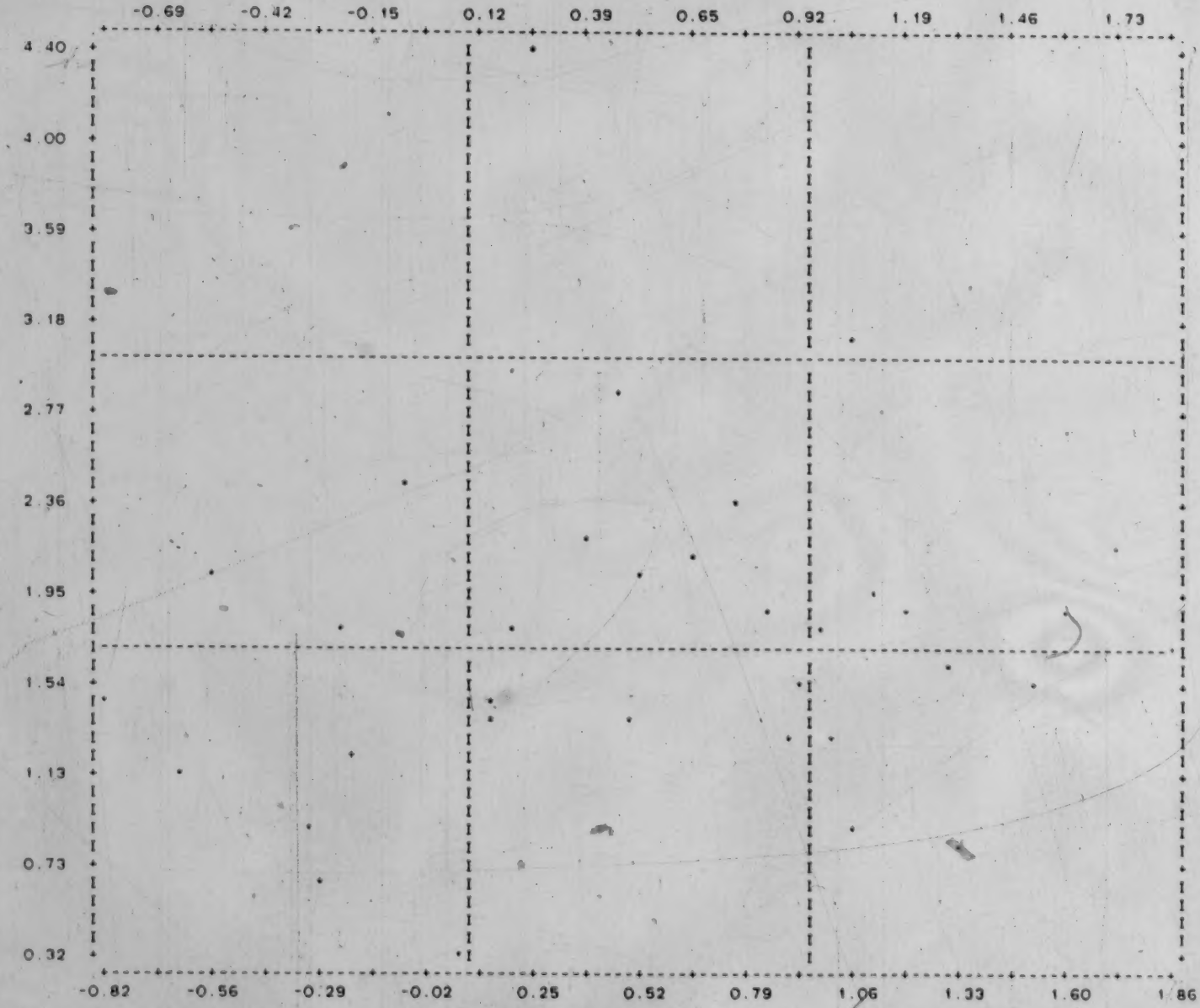


TABLE 28: Scattergram of Square Root of GNP/per capita (down) and Log of Theft Rate (across)

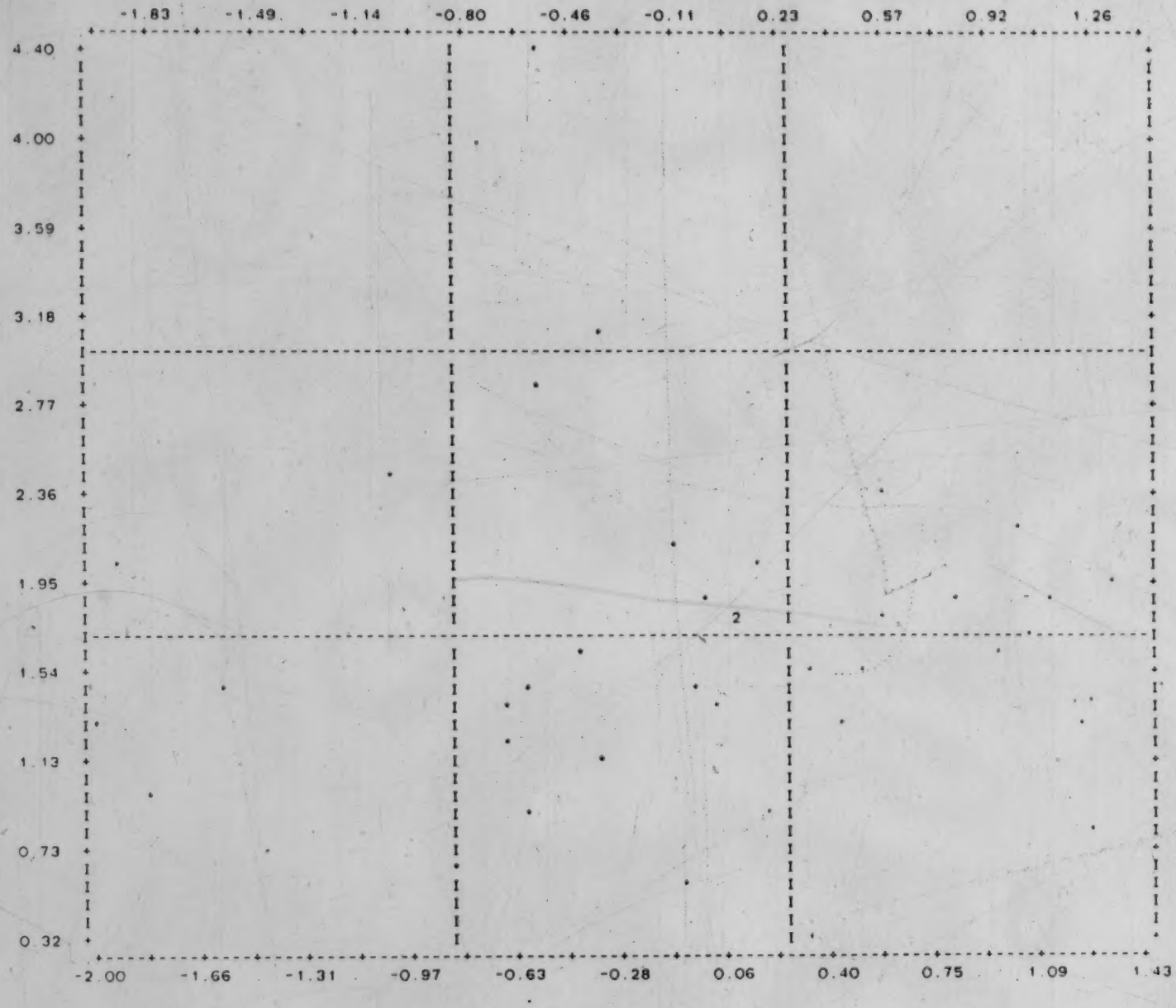


TABLE 29: Scattergram of Square Root of GNP/per capita (down) and Log of Fraud Rate (across)

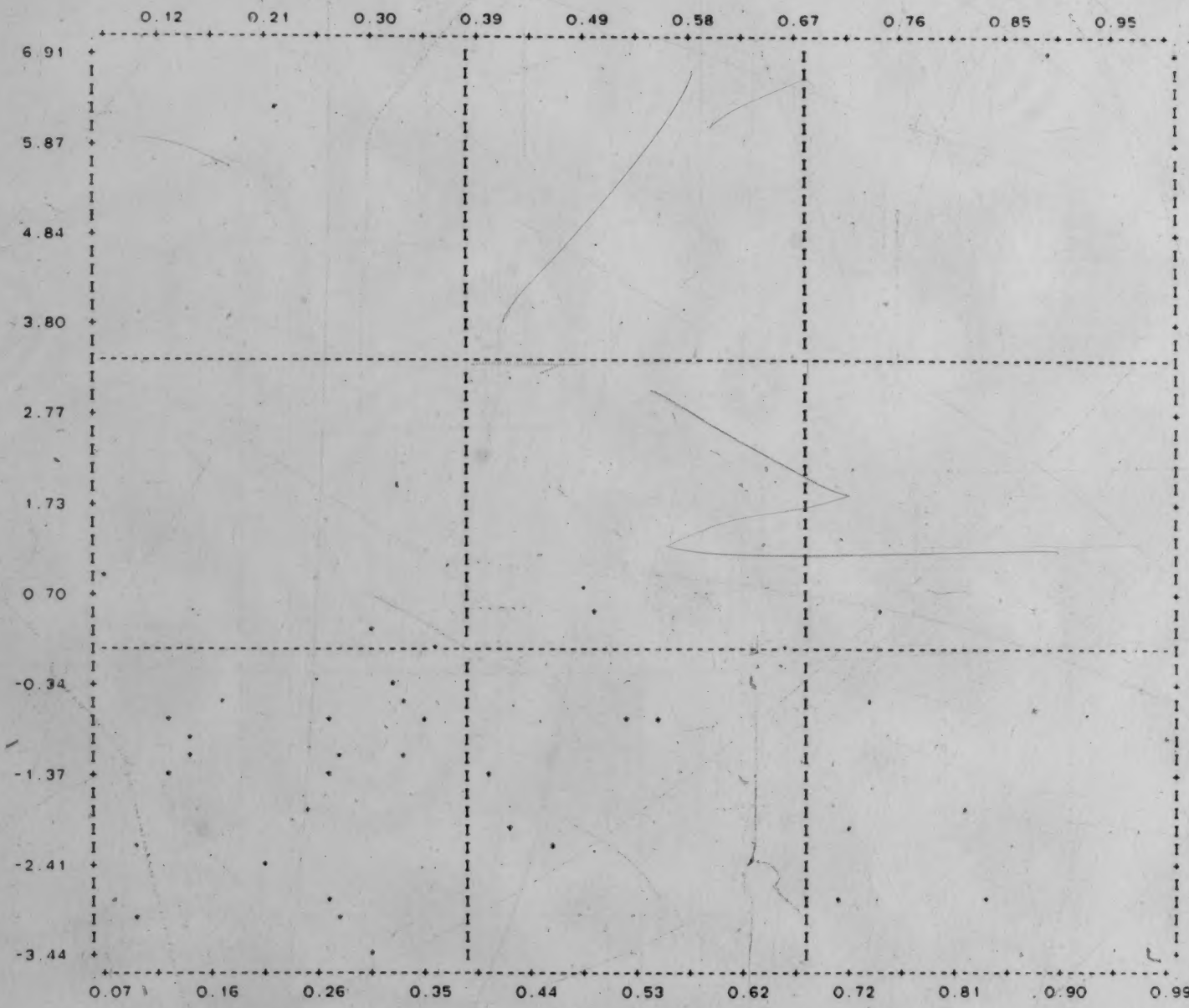


TABLE 30: Scattergram of Converted Log of Urbanization (down) and Square Root of Homicide Rate (across)

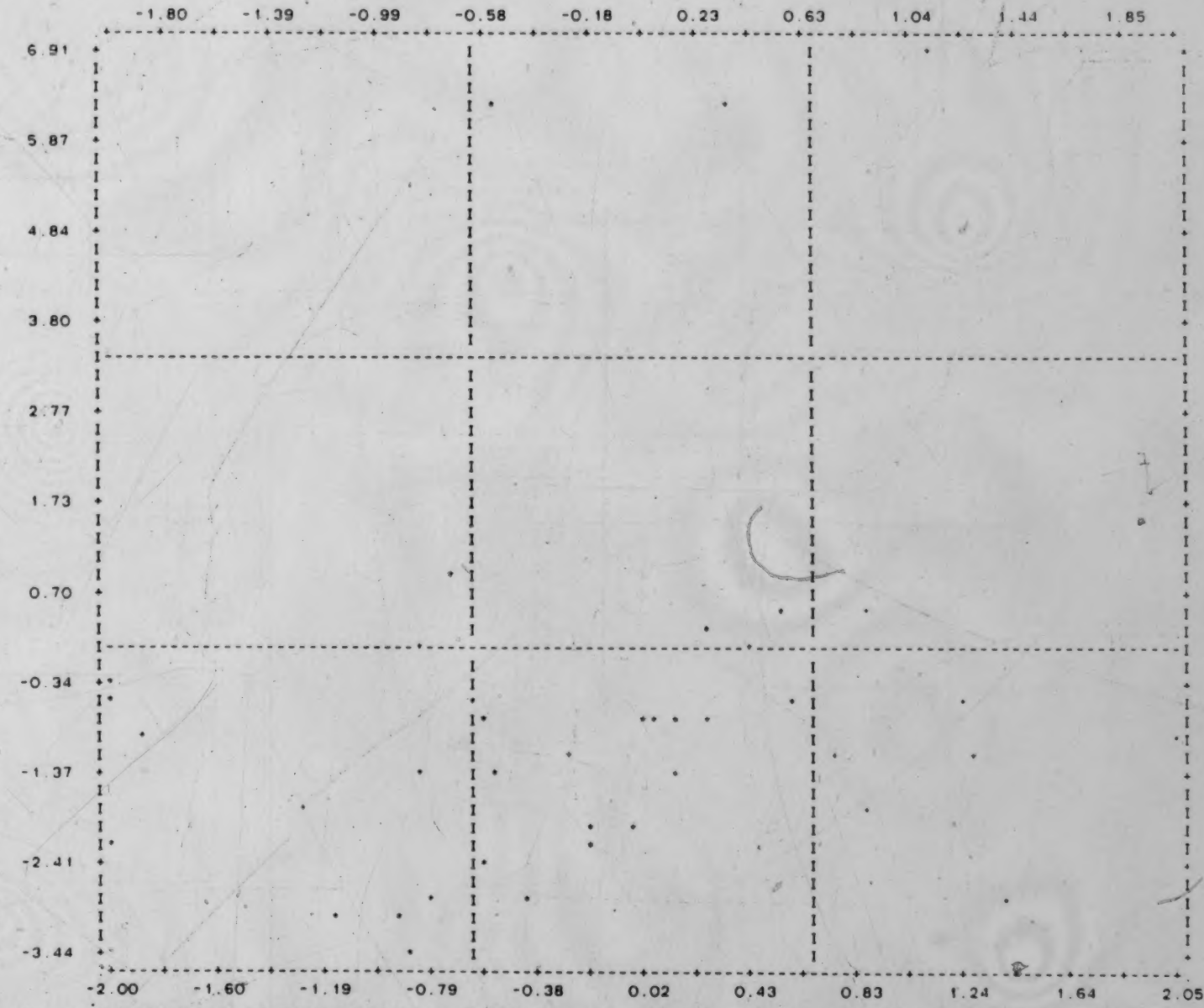


TABLE 31: Scattergram of Converted Log of Urbanization (down) and Log of Larceny Rate (across)

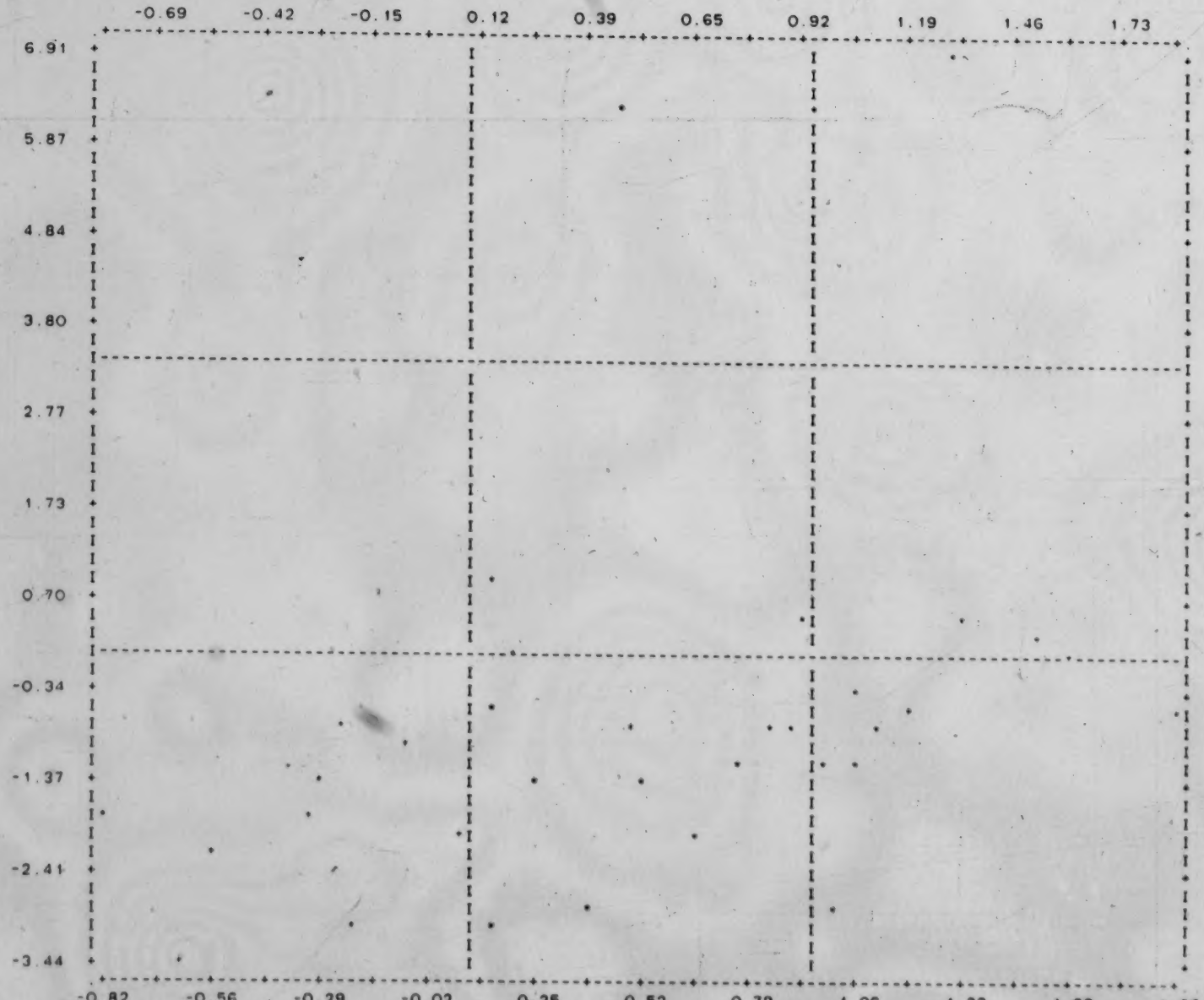


TABLE 32: Scattergram of Converted Log of Urbanization (down) and Log of Theft Rate (across)

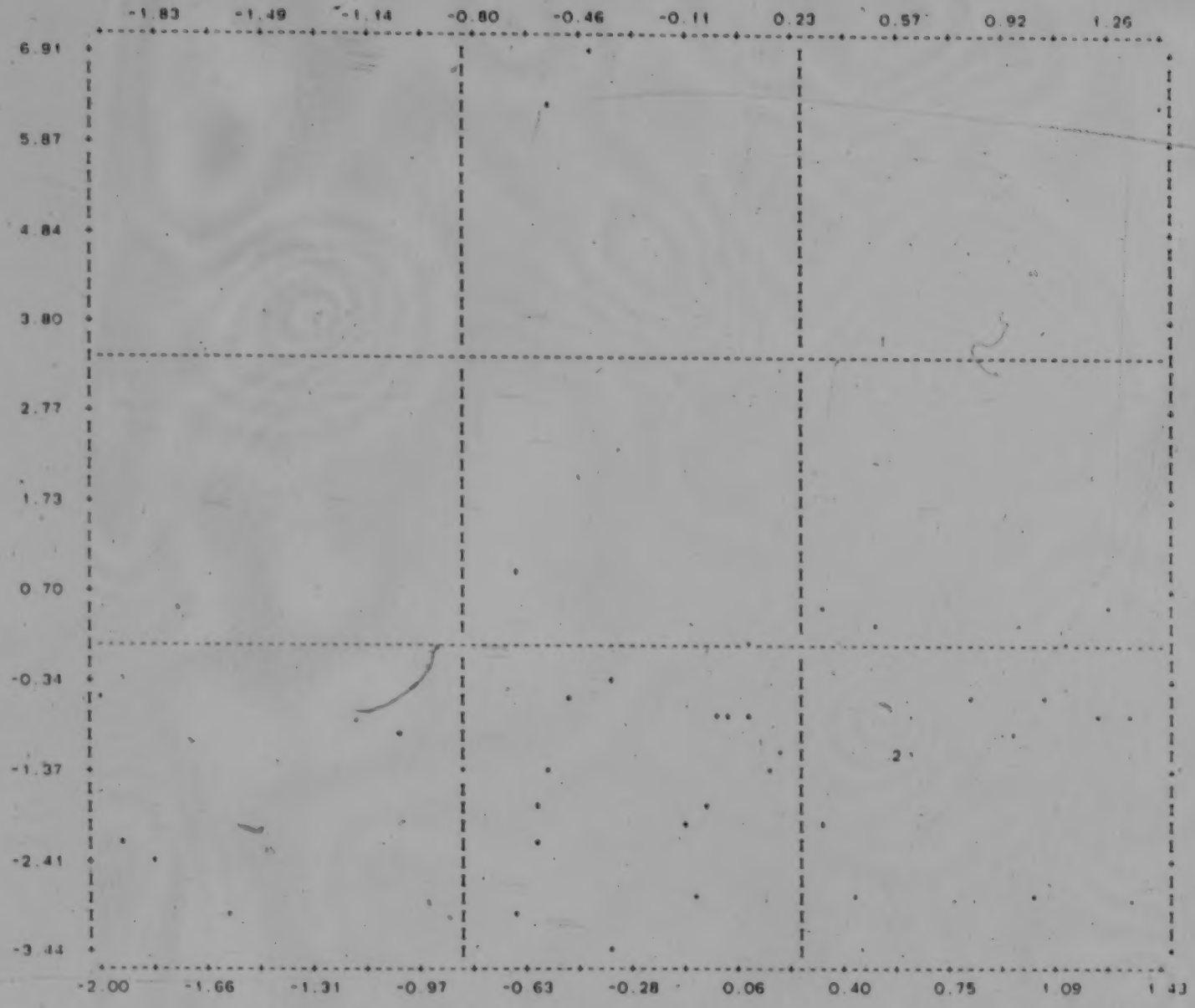


TABLE 33: Scattergram of Converted Log of Urbanization (down) and Log of Theft Rate (across)

of possible direct and indirect effects, as well as the possible operation of suppressor variables. To examine such possibilities and test our third hypothesis, a multiple regression analysis was conducted. Before discussing the multiple regression, however, an overview of the bivariate relationships of each of the independent and dependent varables plotted by scattergrams would be useful to examine whether the relationships are linear or curvilinear, homoscedastic or heteroscedastic, as well as to identify any outliers. These scattergrams are displayed in tables 26 through 45.

Tables 26, 27, 28, and 29 suggest that there is little linear relationship between GNP/per capita and each category of female crime (homicide, larceny, theft, and fraud), although small negative slopes appear for homicide and larceny. In these tables, then, the data are widely spread out in an almost random distribution, though a slight curvilinear trend is observed with larceny and theft. One outlier in each of these tables is prominent.

Tables 30, 31, 32, and 33 show little covariation between urbanization and either homicide or fraud; a small positive relation, with a suggestion of curvilinearity between urbanization and larceny and a moderately positive relation between urbanization and theft. There are, however, two to three outliers in each of these tables.

In tables 34, 35, 36, and 37 the data are almost randomly distributed all over the graphs. This means that

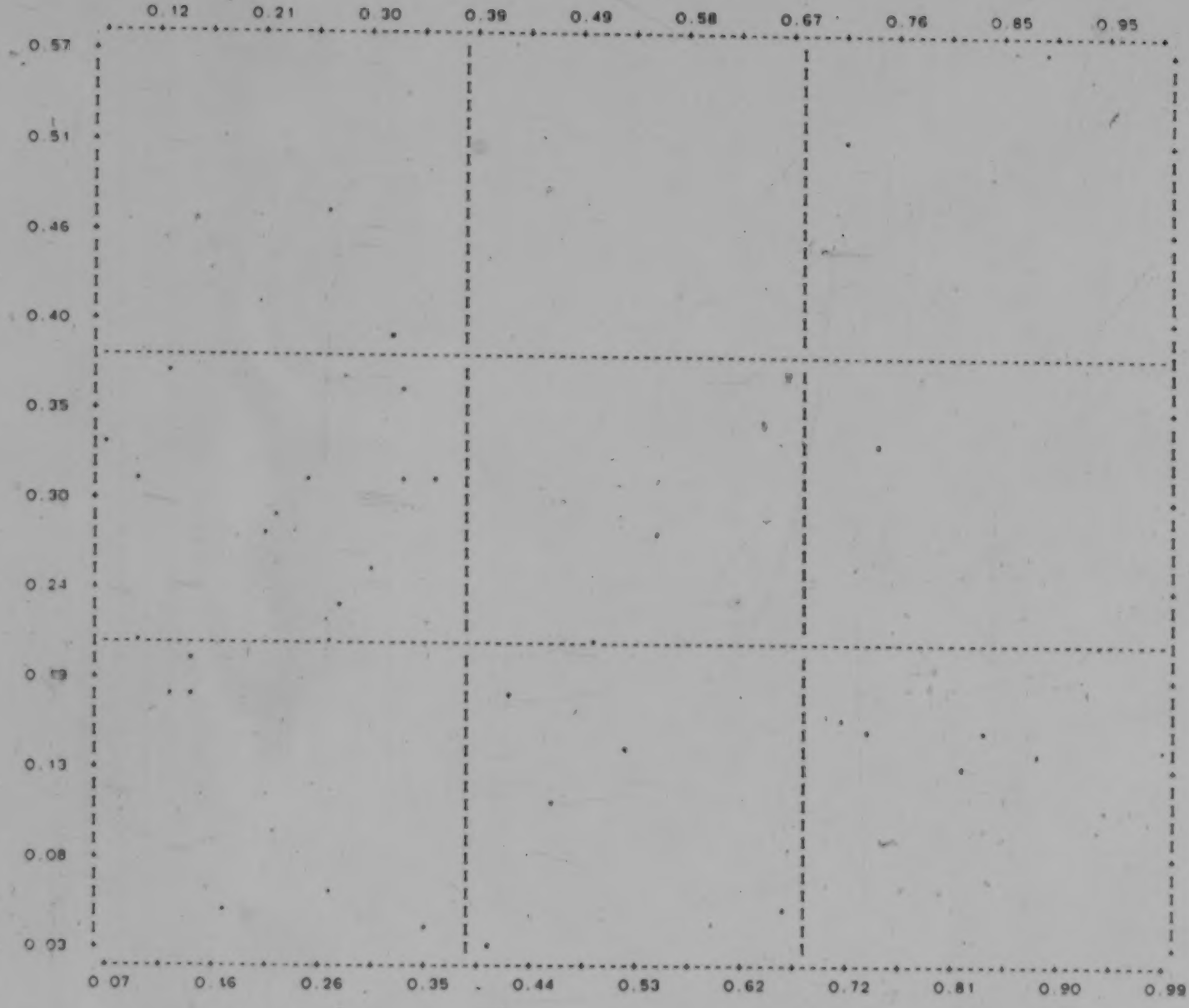


TABLE 34: Scattergram of Female Labour Force (down) and Square Root of Homicide Rate (across)

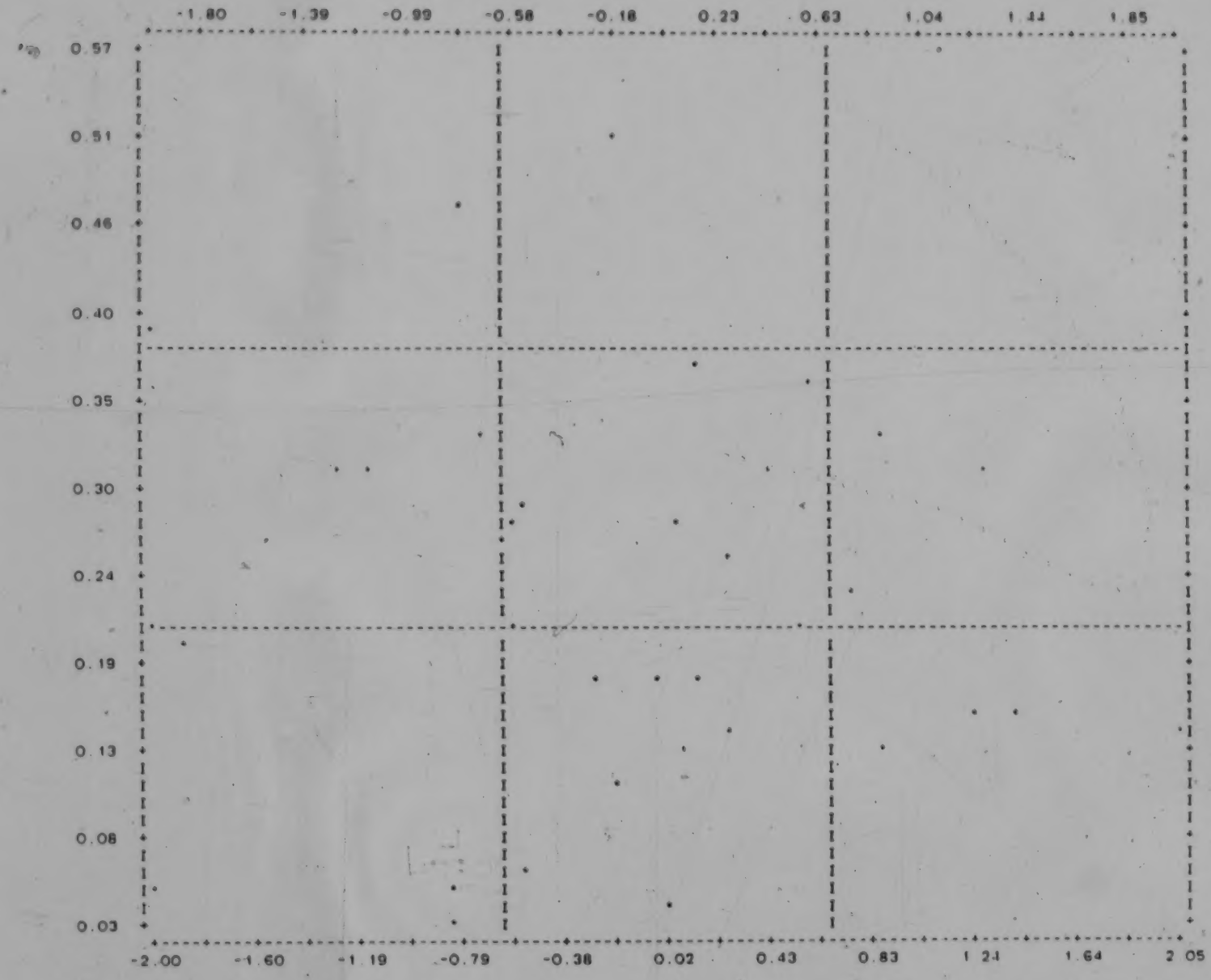


TABLE 35: Scattergram of Female Labour Force (down) and Log of Larceny Rate (across)

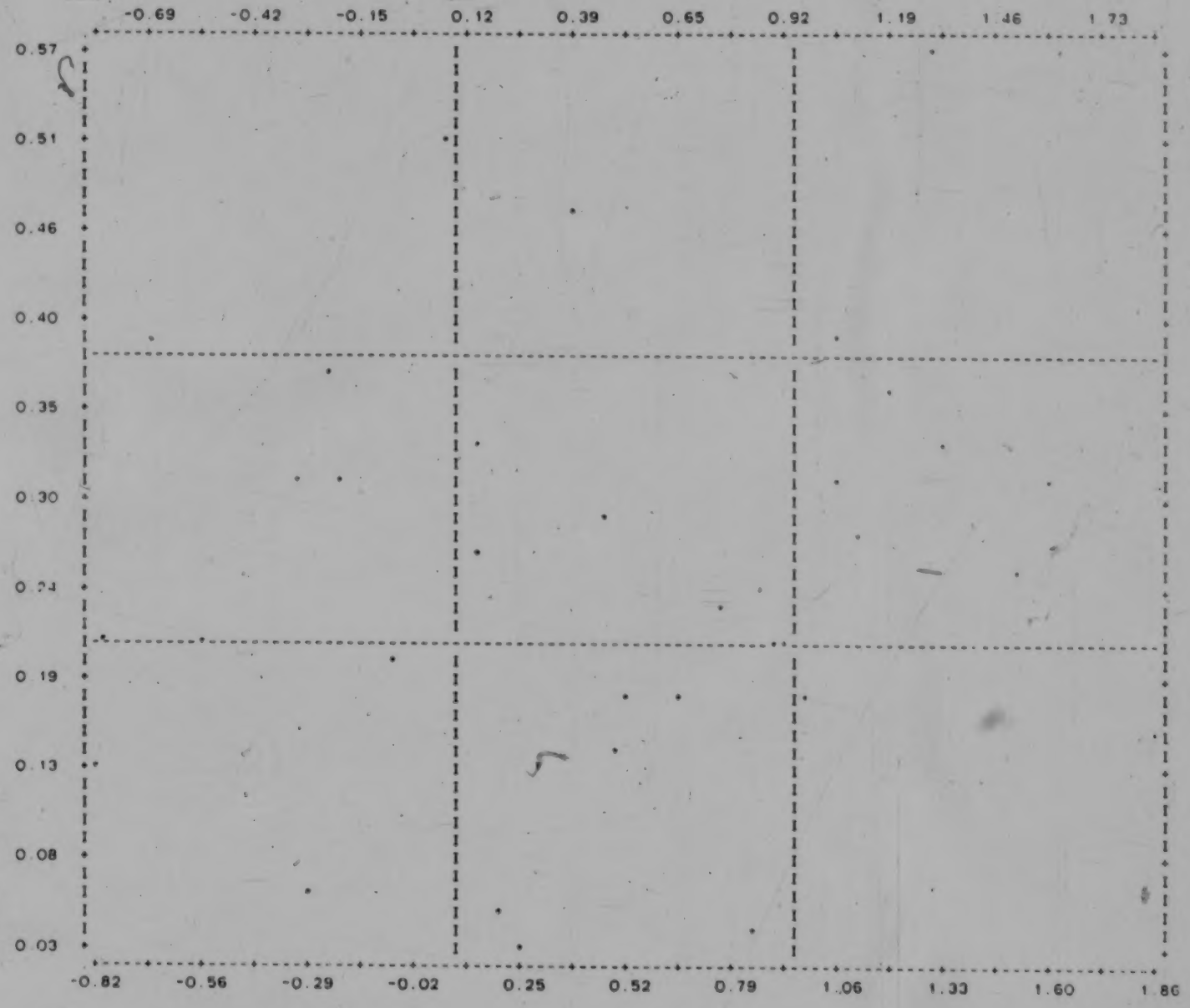


TABLE 36: Scattergram of Female Labour Force (down) and Log of Theft Rate (across)

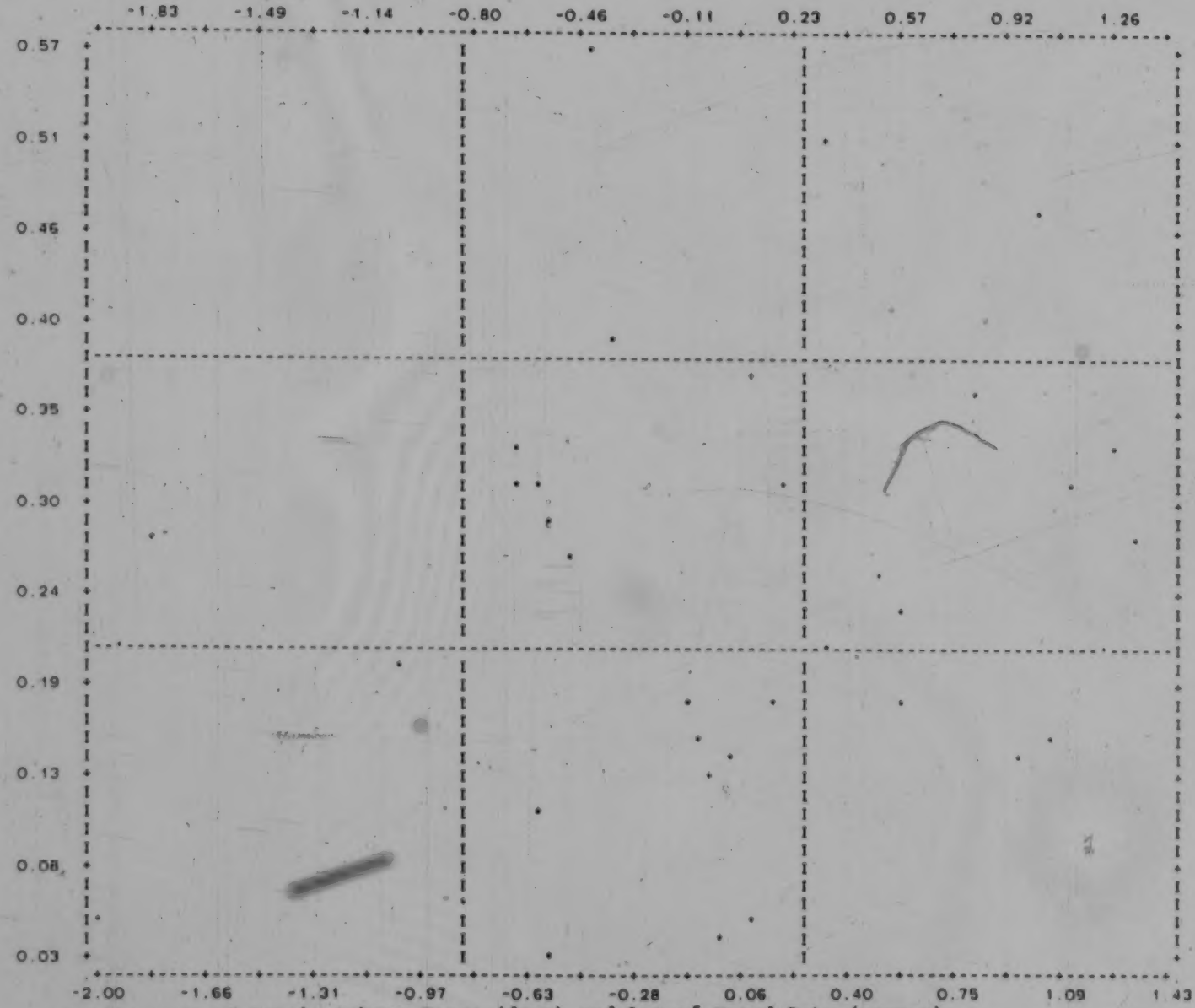


TABLE 37: Scattergram of Female Labour Force (down) and Log of Fraud Rate (across)

there is virtually no covariation between the female labour force participation rate and the four indices of female crime. It is also difficult to identify outliers from these tables.

In tables 38, 39, 40, and 41 the distributions of the data suggest that there is little covariation between female education and the four indices of female crime. In each of these tables a slight curvilinear trend is observed. There is, however, one outlier in each table.

In tables 42 and 43 the data are widely distributed and little trend can be observed. This suggests that there is very little covariation between the fertility rate and either homicide or larceny. No outliers can be identified in these tables. In tables 44 and 45 the data exhibit slight negative covariation between fertility and female theft and fraud. A curvilinear trend can be observed in table 44, as well as in 45, though to a lesser degree.

Since we are trying to measure the possible effects of antecedent variables (spuriousness), the pattern of possible direct and indirect effects, as well as the operation of any suppressor variables, ordinary least squares regression was considered as appropriate. In our results from table 24, for example, the negative relation between fertility and theft could be spuriously due to the relation of both of these variables with urbanization. On the other hand, the apparent lack of any relation between GNP/per capita and female fraud could be suppressed by a third variable such as

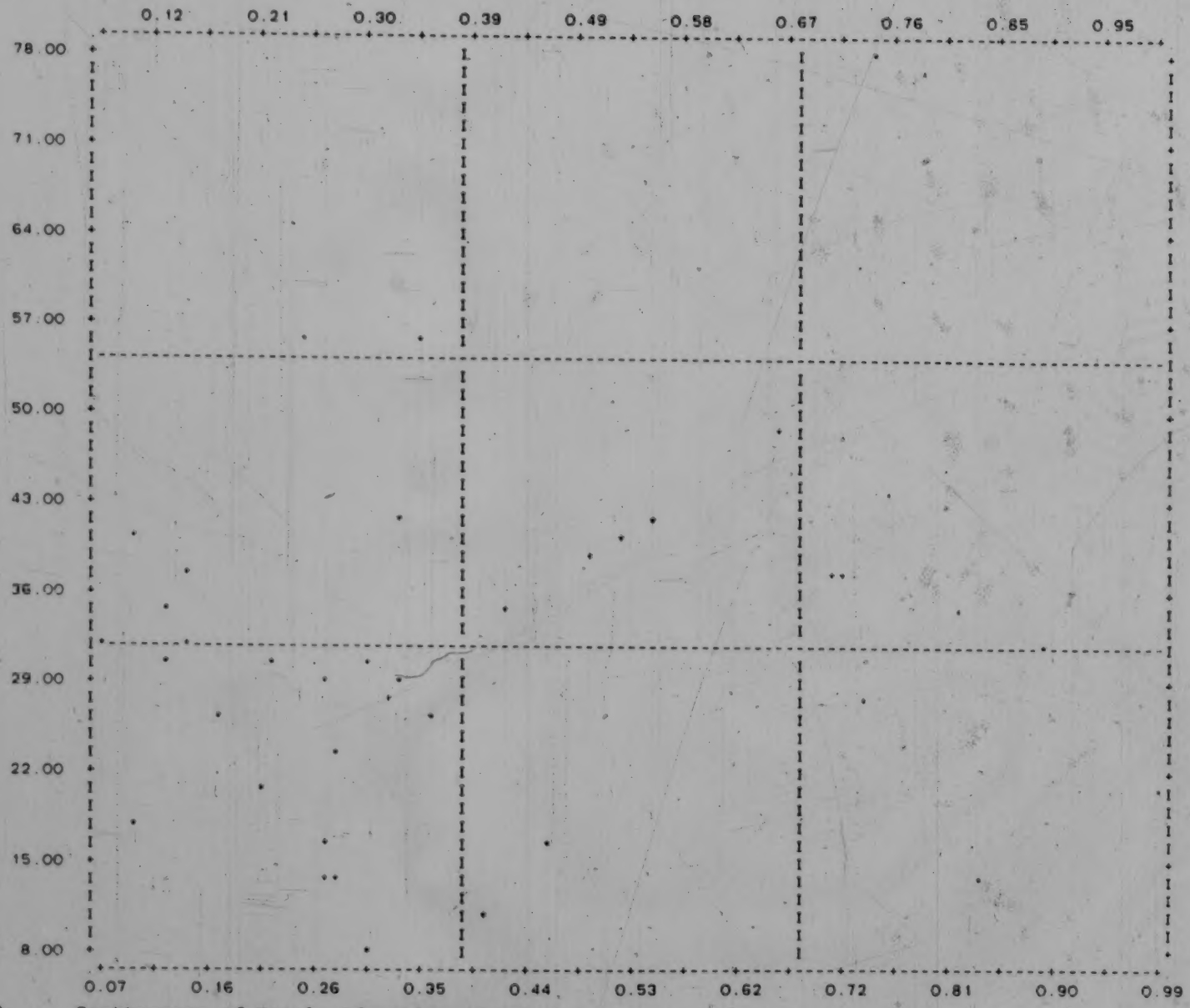


TABLE 38: Scattergram of Female Education (down) and Square Root of Homicide Rate (across)

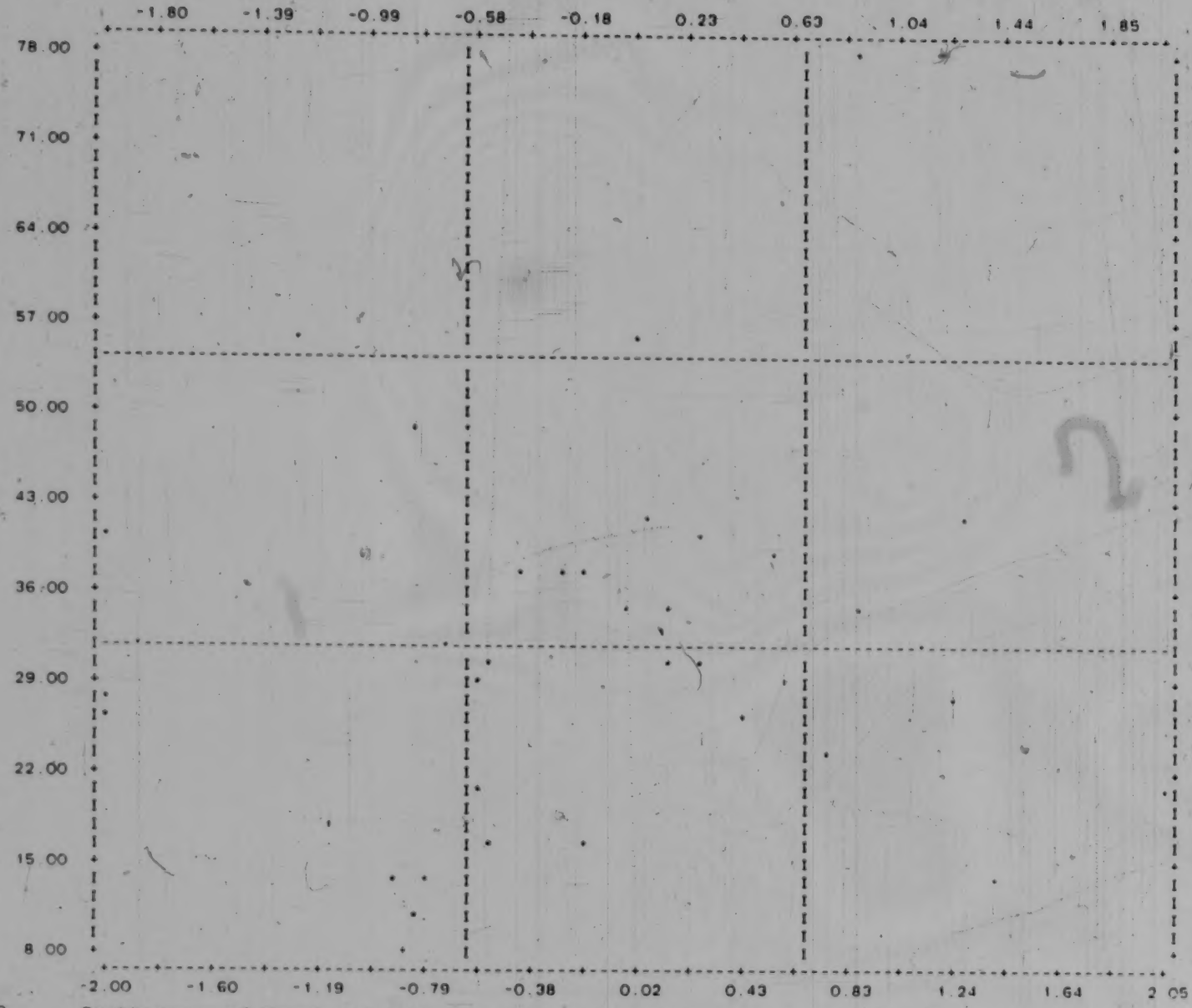


TABLE 39: Scattergram of Female Education (down) and Log of Larceny Rate (across)

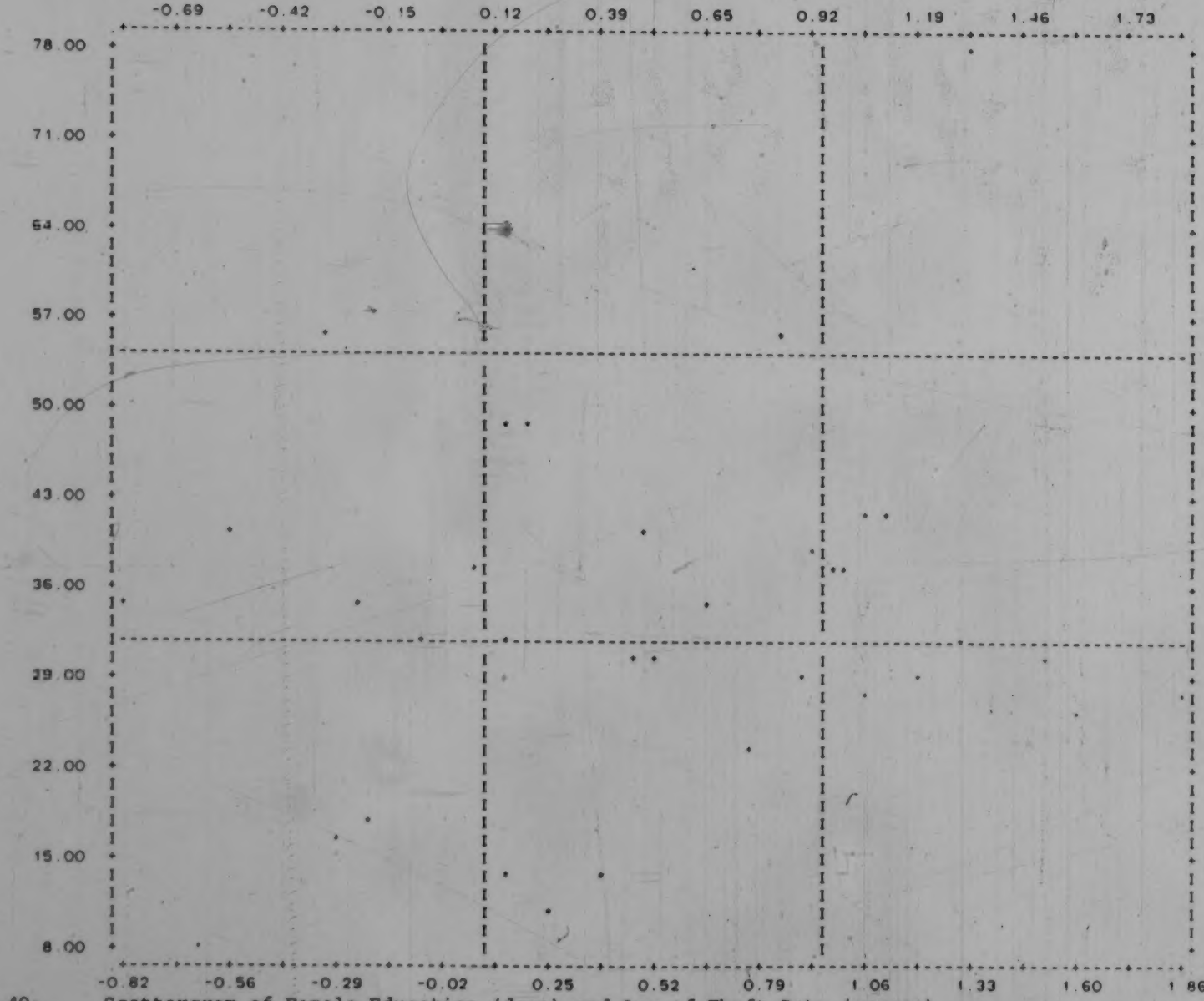


TABLE 40: Scattergram of Female Education (down) and Log of Theft Rate (across)

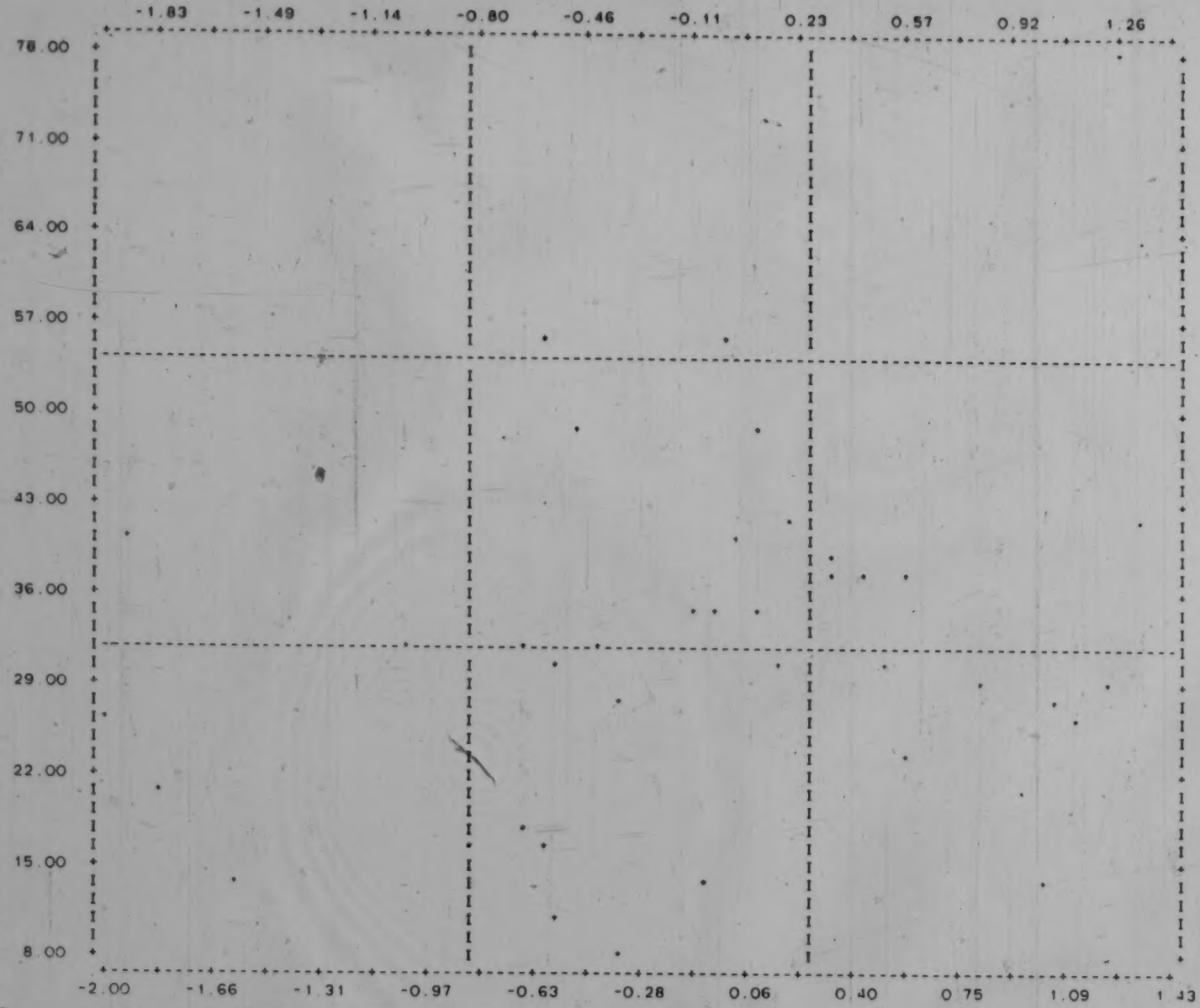


TABLE 41: Scattergram of Female Education (down) and Log of Fraud Rate (across)

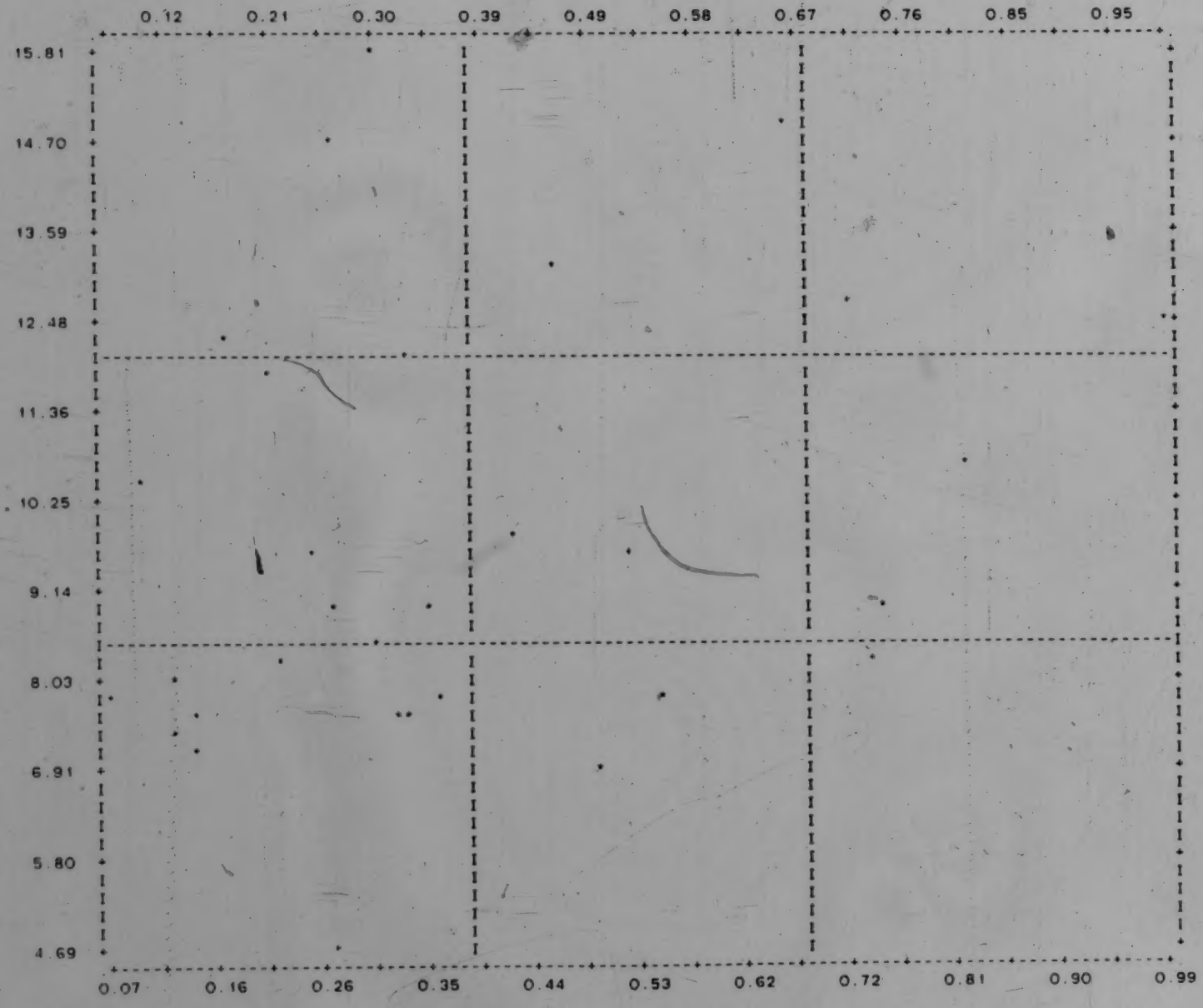


TABLE 42: Scattergram of Square Root of Fertility Rate (down) and Square Root of Homicide Rate (across)

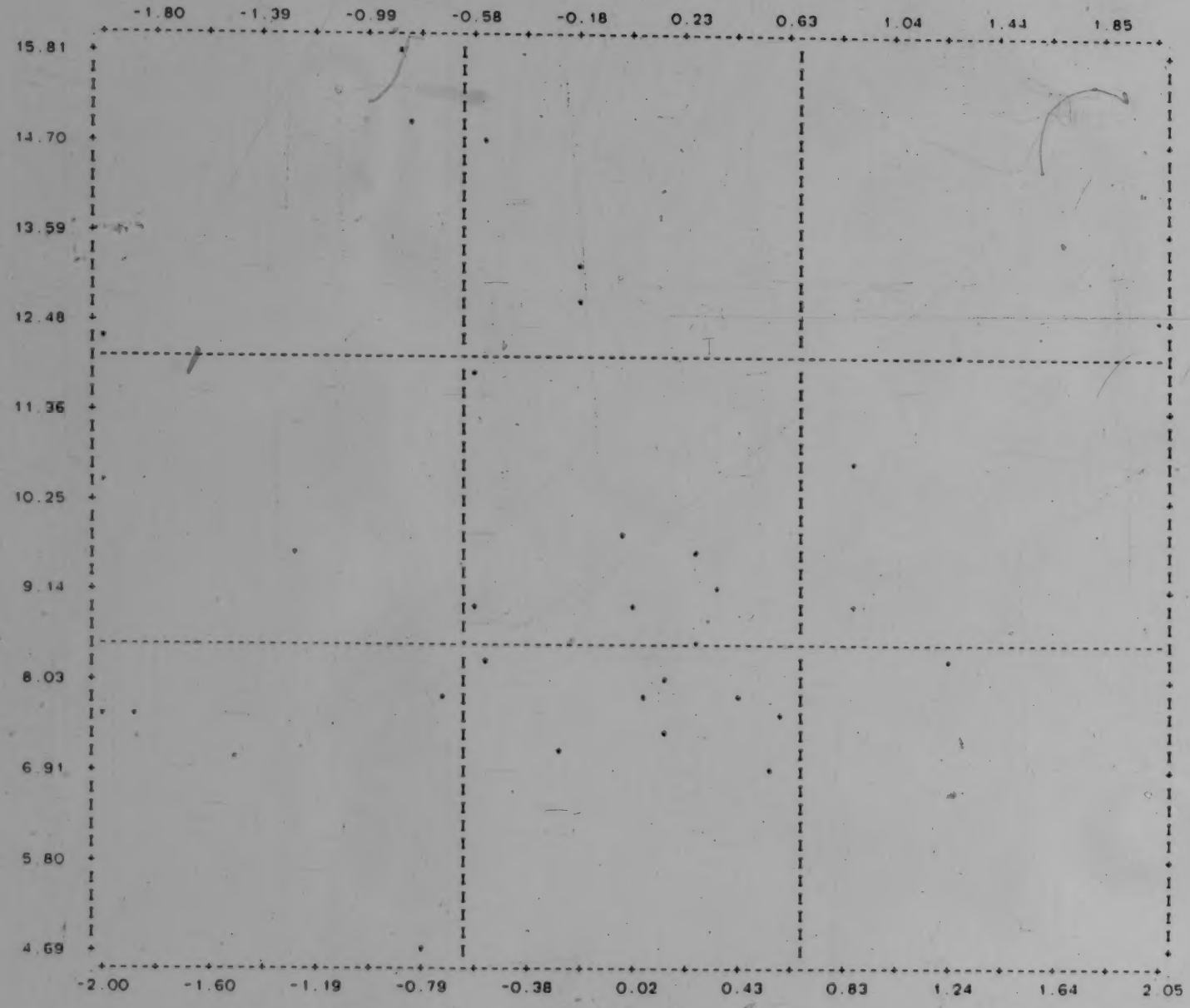


TABLE 43: Scattergram of Square Root of Fertility Rate (down) and Log of Larceny Rate (across)

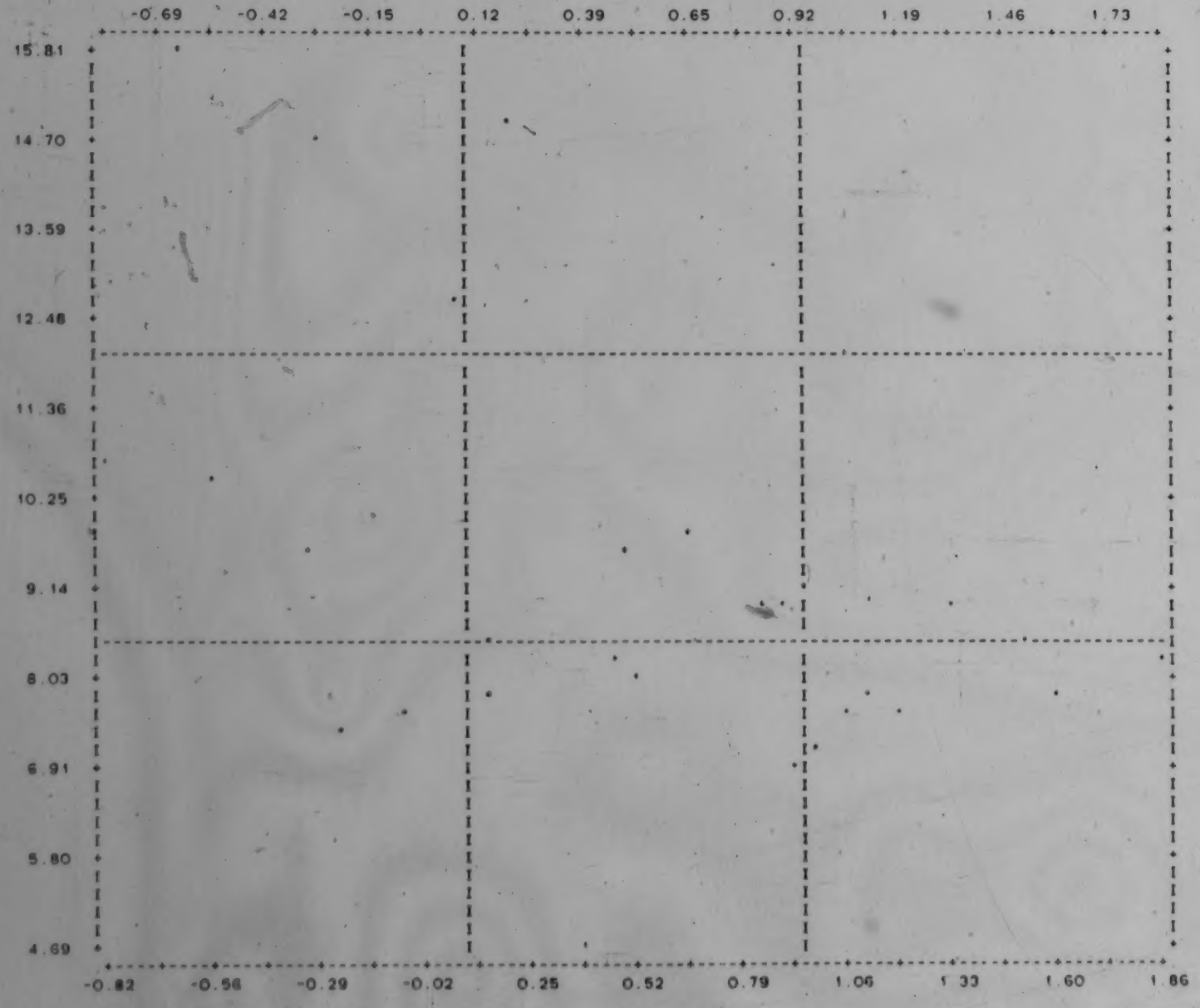


TABLE 44: Scattergram of Square Root of Fertility Rate (down) and Log of Theft Rate (across)

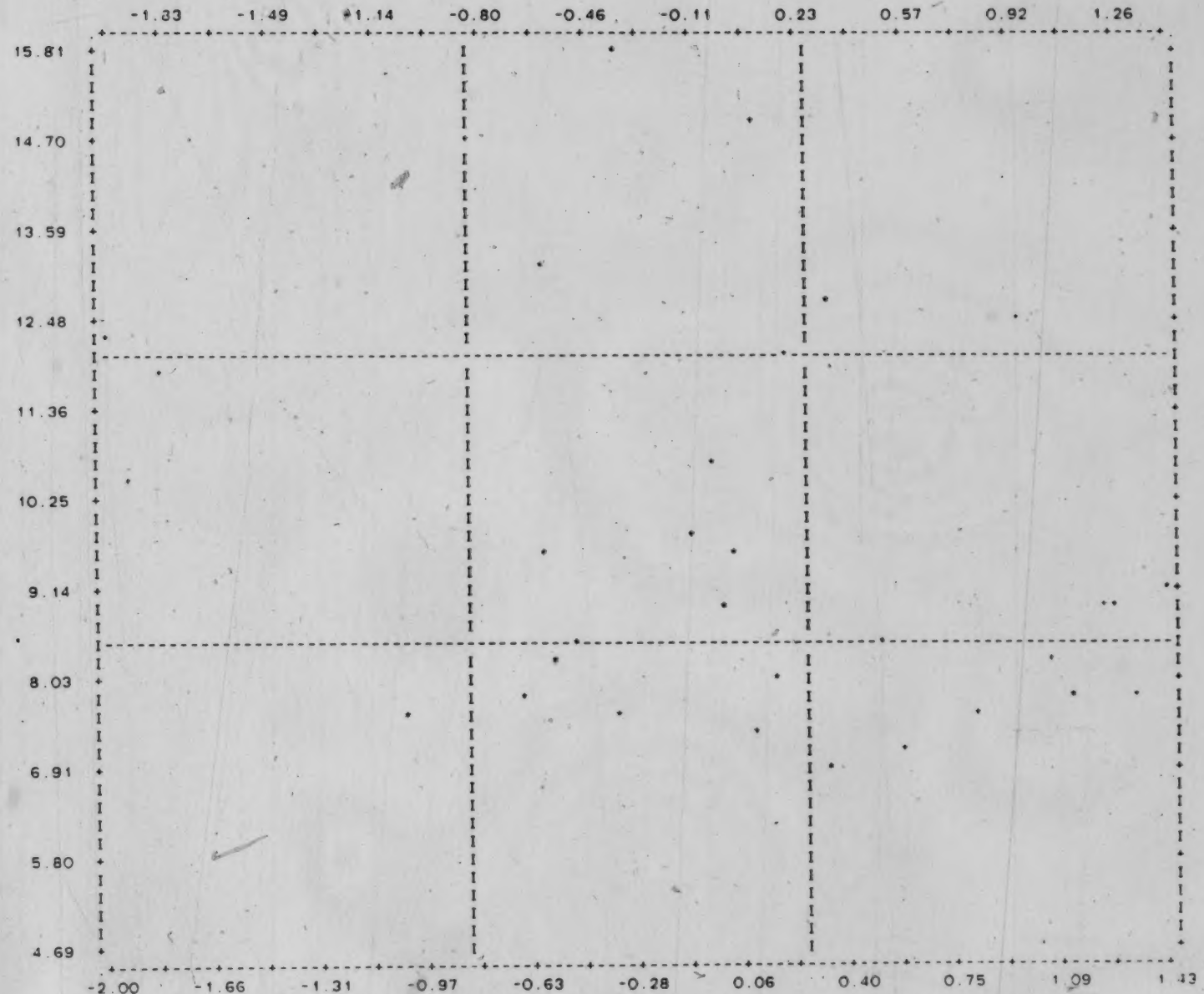


TABLE 45: Scattergram of Square Root of Fertility Rate (down) and Log of Fraud Rate (across)

female education. Alwin and Hauser (1975) suggest ordinary least squares regression as useful for computing path coefficients for successive reduced form equations and then decomposing these coefficients into direct and indirect effects. To test the possible direct and indirect effects of modernization on female crime, as well as test for spuriousness and suppressor effects, the several indicators of modernization and female role participation were included in a multiple regression. The square root of GNP/per capita and log of converted urbanization variable were selected as indicators of modernization and female labour force participation (original values), female education (orginal values) and the square root of fertility were selected as indicators of female role-participation. Each of the indicators of female crime was regressed on the set of two modernization variables on the first step, with the set of female role-participation variables entered on the second step.

The regression results are displayed in table 46. It should be mentioned here that no outliers (as identified in scattergram tables by visual inspection) were excluded from these regressions. Therefore, these results are based on all of the values for these variables, including those extreme values.

These results reveal that very little of the variation in female homicide is explained by the two indicators of modernization and the three female role-participation

Table - 46

Female Crime: Decomposition of Effects and Multiple Regression with Outliers in

| Dependent Variable | Independent Variable | Total Effect | Indirect Effect | Direct Effect |
|---|---|---|---|---|
| Homicide | Urban | .0292 | .0451 | -.0159 |
| | GNP | -.2627 | -.2262 | -.0365 |
| | Labour Fc. | .0264 | | .0264 |
| | Fertility | .3184 | | .3184* |
| | Education | .2028 | | .2028 |
| | $R^2$ = .15 | $\overline{R^2}$ = .03 | F = .84 | |
| Larceny | Urban | .1666 | -.0116 | .1782 |
| | GNP | -.3364* | .1743 | -.5107** |
| | Labour Fc. | -.1591 | | -.1591 |
| | Fertility | -.3047 | | -.3047* |
| | Education | -.0681 | | -.0681 |
| | $R^2$ = .15 | $\overline{R^2}$ = -.03 | F = .85 | |
| Theft | Urban | .2352 | -.0086 | .2438 |
| | GNP | .0532 | .2371 | -.1839 |
| | Labour Fc. | -.0978 | | -.0978 |
| | Fertility | -.4759 | | -.4759** |
| | Education | .0437 | | .0437 |
| | $R^2$ = .21 | $\overline{R^2}$ = .01 | F = 1.03 | |
| Fraud | Urban | .0945 | .0355 | .0590 |
| | GNP | -.0337* | .2320 | -.2657 |
| | Labour Fc. | .0372 | | .0372 |
| | Fertility | -.4938 | | -.4938** |
| | Education | .0802 | | .0802 |
| | $R^2$ = .22 | $\overline{R^2}$ = .06 | F = 1.35 | |

*p <.05
**p <.01
***p <.001
R = Adjusted R Square

variables (R Square=.15). This is particularly the case with the Adjusted R Square (.03). As predicted , GNP/per capita and urbanization exhibit only slight negative direct effects on female homicide. Female labour force participation also has virtually no effect on female homicide (.03). Only fertility rate and female education have small positive effects on female homicide (.32 and .20 respectively). This small positive effect of fertility on female homicide, in particular, is somewhat surprising. Of the small total effect of GNP/per capita (-.26), 86% is indirect, mediated by the female role participation variables.

Similarly, very little of the variation in female larceny is explained by modernization and the female role participation variables (R Square=.15). But the pattern of effects is somewhat different. Only GNP/per capita exhibits a moderate negative net effect on female larceny (-.51), which is quite a bit larger than in the case of female homicide. Furthermore, the enhanced size of its direct effect (-.51) compared to its total effect of -.34 suggests some supressor effect from the female role-participation variables. Fertility has a small but negative direct effect on female larceny, opposite in direction to its effect on female homicide. Urbanization has a minor positive effect and labour force and female education minor negative effects. The results for homicide and larceny are genarally in line with our expectations of only minor effects, though

the direct effect of GNP/per capita on female larceny is somewhat greater than expected. Also unexpected was the positive, though small, effect of fertility on homicide.

A little bit more of the variation in theft is explained by the modernization and female role-participation predictors (R Square=.21). However, the more conservative Adjusted R Square (.01) suggests virtually no predictive accuracy for the overall model. Except for fertility rate, all other predictors have no sizeable effects on female theft in either direction. GNP/per capita and female labour force participation have slight negative effects on female theft while urbanization has a small positive effect. Female education has virtually no effect on female theft. Fertility rate has a moderate negative effect on female theft as predicted. These results support only a minor portion of our hypotheses.

Turning to female fraud, the explained variation by the five predictors is also relatively low (R Square=.22; Adjusted R Square =.06). Urbanization, female labour force, and female education have virtually no effect. Fertility rate has a moderate negative effect, again as predicted. GNP/per capita has a small negative effect on female fraud, a direction opposite to that predicted. There is also some evidence for the suppression of effects of GNP/per capita on female fraud by the female role-participation variables. A slightly larger direct effect (-.27) emerges with controls for the female role-participation variables. These results

offer little predictive accuracy for the general model.

Since we identified by visual inspection some outliers in the scattergram tables, another regression excluding those outliers (calculated by a statistical procedure which is explained below) was thought to be necessary to examine whether those outliers have any considerable effects on the results of the regression. The statistical formula for identifying the outliers is the following (Siegel, forthcoming):

Outliers: either

(i)greater than Fu(highest quartile) + 3/2 x df

Where df = Fu - Fl(lowest quartile)

or

(ii)smaller than Fl - 3/2 x df

By this formula the outliers were identified and excluded from the second regression. The values 3.130 and 4.405 of GNP/per capita square root, 6.213 and 6.907 of converted urbanization, .566 of female labour force participation, and 78 of female education were excluded from the regression.

The results of the second regression (excluding extreme values) are displayed in table 47. These results also suggest that very little of the variation in female homicide is explained by the predictors (R Square = .12). However, there are some changes in these results from that of the former regression. GNP/per capita and urbanization had minor negative direct effects on female homicide in our

earlier regression. In this regression their effect is still slight but their direction has become positive. The effect of fertility is again positive but slightly greater in this regression, quite opposite to our hypothesis. Female labour force and female education have virtually no effect on female homicide, the latter result a bit different from the first regression. But generally the results from the two regressions are similar in failing to predict much of the cross-national variation in female homicide. And the positive effect of fertility remains a surprising result of these analyses.

We can see in table 24 that neither the modernization variables nor the female role-participation variables have any sizeable effect on female larceny with the outliers excluded. These results contrast with our previous findings of moderate to small negative effects for GNP/per capita and fertility. So the results of this second regression for female larceny are more in line with our expectations of little predictive accuracy as far as female violence is concerned.

Our set of predictors do best in explaining variation in female theft (R Square=.32). Urbanization shows a moderate direct effect on female theft in the predicted direction. Fertility rate also has a moderate but negative effect on female theft, as was predicted. These results are supportive of our hypotheses and represent some improvement from the first regression. But female labour force

Table - 47

Female Crime: Decomposition of Effects and Multiple Regression with Outliers out

| Dependent Variable | Independent Variable | Total Effect | Indirect Effect | Direct Effect |
|---|---|---|---|---|
| Homicide | Urban | .0244 | -.0695 | .0939 |
| | GNP | -.1576 | -.2571 | .0995 |
| | Labour Fc. | .0714 | | .0714 |
| | Fertility | .4449 | | .4449** |
| | Education | .0156 | | .0156 |
| | | $R^2$ = .12 | $\overline{R^2}$ = -.08 | F = .59 |
| Larceny | Urban | .1973 | -.0228 | .2201 |
| | GNP | -.0934 | .0596 | -.1530 |
| | Labour Fc. | .0033 | | .0033 |
| | Fertility | -.0952 | | -.0952 |
| | Education | -.1527 | | -.1527 |
| | | $R^2$ = .07 | $\overline{R^2}$ = -.15 | F = .32 |
| Theft | Urban | .4585** | .0301 | .4284** |
| | GNP | .1565 | .2242 | -.0677 |
| | Labour Fc. | -.0633 | | -.0633 |
| | Fertility | -.3470 | | -.3470* |
| | Education | -.1134 | | -.1134 |
| | | $R^2$ = .32 | $\overline{R^2}$ = .12 | F = 1.64 |
| Fraud | Urban | .2459 | -.0070 | .2529 |
| | GNP | .1617 | .1324 | .0293 |
| | Labour Fc. | .2017 | | .2017 |
| | Fertility | -.2653 | | -.2653 |
| | Education | -.0536 | | -.036 |
| | | $R^2$ = .24 | $\overline{R^2}$ = .05 | F = 1.32 |

*p < .05
**p < .01
***p < .001
$\overline{R^2}$ = Adjusted R Square

participation and female education have slight negative effects on female theft, which is opposite in direction to that predicted. The small direct effect of GNP/per capita is also opposite in direction to that predicted. Also contrary to our model is the finding that virtually all of the effect of urbanization is direct and unmediated by the female role-participation variables.

24% of the variation in female fraud is accounted for by the five predictors, but the Adjusted R Square is only .05. This is better prediction than that for homicide and larceny, but still not substantial. Fertility rate, female labour force participation, and urbanization have small direct effects on female fraud in the predicted directions. GNP/per capita and female education have virtually no effect on female fraud. The pattern of these results is somewhat altered from that observed in the first regression: the effect of GNP/per capita is no longer negative; urbanization now has a small positive and, mainly, direct effect; female labour force also now shows a small positive effect; and the moderate negative effect of fertility has here become somewhat smaller in magnitude. Overall, then, these results for female fraud continue to offer little in the way of support for the general model.

## 5. DISCUSSION AND CONCLUSION

We have tested a model that specified that there is a positive, indirect effect of modernization on female property crime through female role-participation, along with the persistence of positive direct effects of modernization on female property crimes (theft and fraud). This model also assumed that indicators of modernization and female-role participation are positively related to female property crime (theft and fraud) and largely unrelated to female violent crime (female homicide and larceny). And more specifically, female public role-participation was expected to be positively and domestic role-participation negatively related to female property crime.

Our results do not exhibit strong support for our hypotheses and model. As expected, little of the variation in female homicide and larceny is explained by the modernization and female role-participation predictors in either of our regressions (with outliers in and with outliers out). While such low predictive accuracy for female homicide and larceny is quite supportive of our hypothesis, the net negative effect of GNP/per capita on female larceny and the minor positive effect of fertility rate on female homicide in the first regression, which is increased to some extent in the second regression, is surprising.

More of the variation in female theft and fraud is explained by the modernization and female role-participation

variables. The moderate negative effect of fertility on female theft and fraud in the first regression, which decreases slightly in the second regression, and the net positive effect of urbanization on female theft in the second regression are supportive of our hypotheses regarding theft and fraud. However, GNP/per capita, female labour force participation, and female education exhibit either no effect or minor negative effects on female theft and fraud contrary to our expectations.

Finally, the overall regression results do not show any predictive accuracy for our third hypothesis which specified both direct and indirect effects of modernization through female role-participation on female property crime. The modernization variables do not exhibit any sizeable indirect effects on female property crime with controls for female role-participation variables. This suggests that female role-participation does not play any substantial mediating role between modernization and female property crime at the cross-national level.

These results can be compared with the results of Hartnagel's (1982) earlier study.There are considerable differences in the results of the present research with those of Hartnagel. In his study, Hartnagel found no significant effect of either modernization or female role-participation on female homicide. In the present research, quite contrary to our hypotheses and Hartnagel's findings, fertility rate shows a significant positive effect

on female homicide. Other minor departures in the case of homicide are - GNP/per capita is positively and female education negatively related to female homicide in Hartnagel's study, but in the present research female education is positively (in both the regressions) and GNP/per capita is negatively related (in the first regression) to female homicide. The results of all other variables and female homicide are almost identical with the results of Hartnagel.

In Hartnagel's study urbanization has a significant negative effect on female larceny, female labour force has a moderate positive effect and fertility has a moderate negative effect. In the present research these results are not similar. Firstly, unlike Hartnagel's study, neither urbanization nor the female role-participation variables have any sizeable effect on female larceny in the present research. Secondly, urbanization has a small positive effect and GNP/per capita a negative effect on female larceny, findings quite contrary to Hartnagel's study.

Hartnagel found a net positive effect of GNP/per capita on female theft and an insignificant negative effect of urbanization, which is quite remote from the results of the present study. The present study shows a significant positive effect of urbanization and an insignificant effect of GNP/per capita on female theft. Other results are more or less similar except female labour force participation has a positive effect in Hartnagel's study but a negative one in

the present study.

Hartnagel also found a net positive effect of GNP/per capita and some moderate positive effect of education on female fraud. In the present study the results are less supportive of the hypotheses. A minor positive effect of urbanization on female fraud is exhibited in the present research while GNP/per capita has a small negative (in the first regression) or no effect (in the second regression). Another difference is that fertility is negatively related to female fraud in the present research but positively in Hartnagel's study.

These differences in results between the present study and the study done by Hartnagel may be due to several facts. These facts are discussed in the following section.

First of all, Hartnagel used data on female crime from INTERPOL for the single year of 1971. He used these data without calculating any crime rate based on the female population in each country; rather he used the proportion of female to total crime. In the present study data on female crime were collected from INTERPOL for the years 1973, 1974, 1975, and 1976. Then average female crime rates were calculated over these four years to minimize the fluctuations in crime recording and reporting in each country from year to year. Therefore, the dependent variable in the present study is more reliable. Finally, average female crime rates based on the female population age 15 and above for each country were calculated. Such

calculations of crime rates produce a lot of difference from the female crime data that were used in Hartnagel's study.

Secondly, Hartnagel used indicators of modernization for a single year (1971). In the present study data for one indicator of modernization were collected for several years to measure the continuous process of modernization. Such a difference in the measurement of modernization (GNP/per capita) in the present study more adequately captures its conceptual meaning and may contribute to the difference in results.

Thirdly, in the present study frequency distributions of each dependent and independent variable were examined and some data transformations were done to improve the shape of the distributions. In Hartnagel's study no such data transformation was done. Therefore, his results could be largely artifacts resulting from highly skewed distributions, outliers, etc.

Fourthly, though both of the studies begin with forty countries as their cases of observation, there is some variation in the selection of countries between the two studies. Many countries are not common in these studies. These countries are Burma, Canada, Chile, El Salvador, Fiji, India, Iraq, Israel, Jamaica, Malta, Malawi, Malaysia, Mauritius, Romania, Spain, Tunisia, and Zambia.

All these differences might have produced the different results in the correlation and regression analyses of the two studies. Furthermore, on the basis of the above

comparisons, it could be argued that the present study is better off with respect to its data set and measurement procedures, which ultimately should produce more valid and reliable results than that of Hartnagel.

The present results are less supportive of the model than Hartnagel's study. This leads us to raise several questions. One question may be whether the theory upon which this research is based is wrong, or at least requires modification, and whether we should look for other explanations for cross-national variation in female crime. Another question may be whether the data that are being used in these types of studies are sufficiently reliable and valid. A third issue concerns whether female crime rates are rising at all at the cross-national level. The following discussion will be focused on these issues.

While looking for the possible weakness of our theory, it should be recalled that some scholars (Eisenstadt, 1973; Frank, 1971, Giddens, 1982) have raised severe criticisms regarding modernization theory. According to this theory, modernization is a universal process of social change that leads to the total transformation of the traditional society to a modern western society (Moore, 1963; Smelser, 1959; Deutsch, 1961). A higher GNP/per capita and standard of living, literacy, technology etc. are often cited as the measures of such modernization. Modernization theory, then, suggests that the modernization process should bring higher income, better living conditions, more material goods,

literacy etc. in the underdeveloped countries. The critics of this theory point out that this is not the case. According to them, modernization theory ignores the economic dominance of the modern western world over the underdeveloped countries. The development of the underdeveloped countries is also explained in terms of both the history of colonialism and the current economic exploitation by the western capitalist world of the rest (Frank, 1971).

Another issue also ignored by modernization theory is the economic inequality that exits among members of society. It has been the case in all of the countries following the western capitalistic model that relatively few people control most of the means of production of the country. Some criminologists have argued that this samle class ultimately controls the political power and makes the laws (Chambliss and Seidman, 1971; Quinney, 1970; Sykes, 1974). These laws are devised to protect their interests and foster greater economic inequalities among societal members. As competition for existence and unemployment rise there is a concomitant rise of economic inequality. Such a situation is quite likely to lead the economically deprived people to violate the laws that do not serve the interests of the majority of the people. Particularly in the developing countries, the rising elite class, who are the products of the modernization process, become the economic allies of the capitalists of the western world. Both the capitalists of

the western world and the elites of the developing countries have one thing in common - that is, they control the economy and ultimately the political process of the country which makes the laws. These laws are frequently favourable for their economic goals. Modernization, therefore, seems to be fostering the idea of development of a higher income, standard of living, material goods etc. for some of the people in the society, not for all. In that case GNP/per capita (average income of people in each country) seems not to be the successful predictor for higher female crime rates since it does not take into account the range of income in each country, the extreme lower and higher incomes and their percentages, and the relative income of females in that income scale. If such a measure would have been taken into account, we would probably find that women in general belong to the lowest income strata in every country in comparison to men. Moreover, in many of the developing countries most women are restricted to the role of wife and mother. Usually these women who are restricted to the domestic role (the role of wife and mother) are non-earning members and depend on the income of men. Therefore, they are either out of the income scale or belong to the lowest income group. If this is so then the growth in GNP/per capita is in no way related to the growth in income of the women. This could be one of the vital reasons why our measure of GNP/per capita is not substantially associated with female property crime.

Urbanization (proportion of people in cities) did the best in explaining female property crime in general and female theft in particular in our research. This is due to its possible association with different aspects of city life itself. For example, residents of cities experience greater economic inequality, observe the contrast between better and worse housing and residential areas, material goods, and living standard. The greater the urbanization the more the contrast in these features becomes visible. Such a situation is quite likely to lead the economically deprived women to commit property crime where opportunities to commit these crime are much greater, on the one hand, and social restraint (well accepted or justified laws) is loose, on the other.

The moderate negative effect of GNP/per capita on female larceny (in the first regression) and the positive moderate effects of fertility on female homicide (in both the regressions) were somewhat surprising. However, one possible expalanation for the negative effect of GNP/per capita on female larceny is that, though larceny is a violent type of crime (armed robbery, burglary, house breaking), the motive for commiting larceny may be largely economic. Therefore, the larceny rate would probably be higher when there are a greater number of economically deprived people. Higher GNP/per capita is an indicator of economic prosperity, which at least reduces the economic deprivation in the society and finally may result in lower

female larceny. On the other hand, a possible explanation for the positive effects of fertility rate on female homicide is that a higher fertility rate indicates a more traditional family system where women are more restricted in their social roles and expected to take care of the children and the household. Furthermore, as family size increases, income is distributed among more people which decreases the family's standard of living. As a result, economic deprivation increases, with an increase of hardship for women to feed and take care of the children, husbands, and themselves. This may lead to increased stress in family relations which is expressed by women in the killing of their own husbands and children in an aggravated situation.

Though the line of argument of the critics of modernization theory direct us in explaining the absence of any substantial effect of GNP/per capita and the presence of some effect of urbanization on female property crime, the effects of fertility rate, female labour force participation, and female education on female property crime which are observed in the present research seem to be inconsistent with the idea of the critics of modernization theory. Hypothetically speaking, the critics of modernization theory would probably argue that a higher fertility rate leads to a larger family in which women are expected to take care of the children and the household. This means women are expected to be more restricted to the role of wife and mother with a higher fertility rate. The

higher the fertility rate the more chance the women is restricted within the family unit, economically dependent, and paternalistically cared for. This suggests that women will be more socially and economically deprived with domestic role-participation. Such a situation could lead them not to be law abiding, especially with respect to those laws that concern property crime. This argument would, therefore, predict a positive relationship between the fertility rate and female property crime. The negative effect of fertility rate on female property crime in our research is not consistent with this line of argument. Rather such results are consistent with the idea that a higher fertility rate restricts women more to the traditional wife and mother role. This leads the women to have close ties with children, husband, and parents which restrict them within the family unit and offers little opportunity to commit crime. This supports, again, what we hypothesized in this research.

Our results regarding female labour force participation and female education are in line neither with the arguments of modernization theory nor those of the critics of the modernization theory. According to modernization theory it could be argued that the greater economic and social freedom of women leads to a breakdown of the traditional ties and restraints and opens up motivation and opportunities to commit property crime in industrial societies. Also female education should increase women's economic and social

freedom which ultimately leads to higher property crime again through the looseniag of social ties and greater motivation and opportunities to commit crime. On the other hand, according to the line of argument of the critics of modernization theory, women should commit more property crime with the increasing participation of women in the labour force and education sine this greater participation does not result in an equal economic and social position relative to men. Our results for female labour force participation and female education are not in line with either argument. This leads us to think about the possible methodological problems that may be associated with such issues. The major methodological concerns are the reliability and the validity of the data that have been used in this research.

Though Wellford (1974), Krohn (1978), and Hartnagel (1982) argue that the problem of systematic bias in INTERPOL crime data is not crucial, other scholars have raised some points regarding the problems associated with the use of such data. For example, Braithwaite (1980) reviews these INTERPOL data and suggests that, except for homicide, all other categories of international crime data are invalid and unreliable. Another issue to be considered is that the operation of police may vary by country and culture. Generally speaking, the operation of the police in most of the developed countries is impersonal, formal, and bureaucratic. This may be related to the ability of these

countries to offer every employee (police) a sufficient salary to maintain a good standard of living. But this is not the case in most of the developing countries. Though the role of the police is formally defined, their conduct is often characterized by favouratism and misappropriation because of kinship ties, economic necessity, and political reasons. These factors affect the reliability and validity of crime data in most of the developing countries.

In addition, Mukherjee and Scutt (1979) and Mukherjee and Fitzgerald (1981) oppose the notion of 'rising female crime' which is based on INTERPOL and Uniform Crime Reports. They reanalysed the United States Uniform Crime Report data that were used by Adler and Simon using techniques to standardize the crime data to sex-specific rates per 100,000 population which, according to them, insures comparability. On the basis of their reanalysis, they conclude in their 'Myth of Rising Female Crime' that the male/female ratio of participation in crime from 1960 to 1972 has remained fairly stable. Furthermore, they analysed all cases before Magistrates' Courts in four Australian states for each year 1900 to 1975. Considering the total offenses in each state for males and females, these authors observed no monotonic or linear patterns. Steffensmeier (1978, 1980) also pointed out the problems of the unstandardized data that were used by Adler and Simon as the basis for their hypothesis that the female crime rate is rising all over the world. However, it should be pointed out here that the works of

Mukherjee, Scutt, Fitzerald, and Steffensmeier were mainly concentrated on Adler's hypothesis of rising female criminality all over the world. Most of them used longitudinal data sets for their research while our research is cross-national at one point in time. This means we expect variation in female crime from country to country. We mentioned earlier that 25 countries were selected from the developing world and 15 from the developed world. We expected lower female crime in the developing countries than in their developed counterparts because the former countries are still in the process of modernization and should have less egalitarian sex-roles. For instance, in the frequency distribution of female theft in table 4, five developing countries (Peru, Mali, Morocco, Malaysia, Phillipines) have the five lowest female theft rates. On the other hand, three developed countries (Federal Republic of Germany, Australia, and Netherlands) have the highest theft rates. Such variation can also be observed in the other female crime frequency distribution tables. These cross-national variations in female crime suggest a good deal of variation in such crime by development status and therefore run counter to the arguments of Mukherjee, Scutt, Fitzerald, and Steffensmeier.

So it is quite difficult to conclude, at least at this point, which of the views regarding international crime data is most reasonable without having enough support from research on this particular topic. It also seems difficult

to determine whether the theory upon which this research is based is wrong. What seems to be needed now is to examine the possible problems that may have been associatted with female crime data as well as those international data on each of the independent variables and, based upon research, to reach a better general conclusion whether these data are appropriate to use in this type of study.

Conclusion:

Though the present research reveals some positive moderate effect of urbanization and fertility on female theft and homicide, respectively, and some moderate negative effect of fertility rate on female theft and fraud, the overall explained variation in female crime is low. However, it is quite premature to suggest on the basis of the present research that the theory upon which this research is based is wrong. Neither can we blame the data that have been used in this research, without proper investigation whether they produce such results due to problems of systematic bias and inconsistency in crime recording and reporting. We have also suggested that more detailed study of female crime including economic variables may do better in explaining female crime at the cross-national level. Before such research, however, investigation of the national/international data that are being used in this type of study should be done and a general conclusion reached whether these data are appropriate for this type of study.

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